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3. The Cultivated Hederas

by

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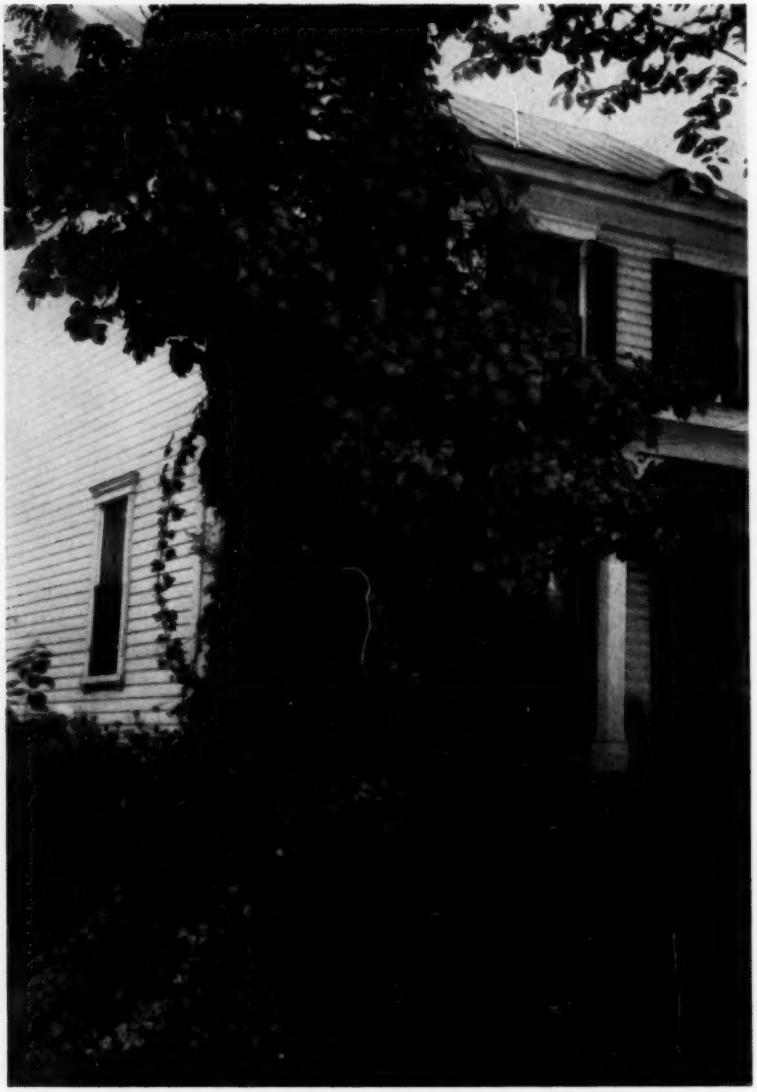

74. Typical Hedera Helix, English ivy, growing on an elm tree, Rockville, Maryland. Note the arborescent fruiting branches as produced above the vine-like juvenile foliage.

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ARTICLE 3. THE CULTIVATED HEDERAS.

It is the purpose of this paper to give an account of the cultivated species of the genus Hedera and of their recognized published variants, to delineate these groups by keys accompanied by descriptions and illustrations, to place in synonomy the multitude of names which, for technical or taxonomic reasons, are considered untenable, and to clarify the involved literature of the subject.

A decade ago the late Lucile G. Smith of the Department of Floriculture and Ornamental Horticulture at Cornell University began a comprehensive study of the cultivated ivies. As originally outlined it was to account for their nomenclature, taxonomy and horticultural adaptations. After Miss Smith's death the work was continued by R. C. Allen of that Department, under whose direction a collection of all available named variants of Hedera was assembled. The horticultural problems of hardiness, culture, propagation and use are being continued by him and it is anticipated they will be published separately. This present paper concerns itself with the systematic aspect of the problem.

The studies embodied in this paper have been based on the living collections available at the Brooklyn Botanical Gardens, the "Skylands Farms" estate of C. McK. Lewis at Sloatsburg, New York, and at Cornell University. Fundamental studies have been made with the aid of the large collection of native and cultivated herbarium specimens borrowed from the Arnold Arboretum and the cultivated material in the herbaria of the New York and Brooklyn Botanical Gardens.

The Cornell living collection represents the gift of smaller collections by ivy specialists and commercial plantsmen. It comprises more than one thousand plants, grown in pots and occupying four sixty-foot benches of an entire greenhouse, or outdoors under various environmental conditions for hardiness and adaptability trials. All of the species and variants accounted for in this paper are included in the collection save in one or two cases; such exceptions are properly noted in the text. Except for these omissions, the descriptions provided in this paper were made directly from living plants. Herbarium specimens have been made of all accessions and a complete set is deposited in the Bailey Hortorium herbarium, consisting of 580 sheets. Because of high maintenance costs the living collection will not be maintained in its entirety.

The authors wish to express their appreciation for the aid given by all who have donated living material of the ivies in the Cornell collection; to Alfred Bates for helpful suggestions; to A. C. Smith, Curator of the Arnold

Arboretum for the loan of their material over a period of several months; and to Alfred Rehder of the Arnold Arboretum who has read the manuscript critically and to whom we are indebted for valued corrections and aids especially with respect to nomenclatorial and bibliographical problems. The project represents a cooperative enterprise between the Bailey Hortorium, to whose staff the senior author belongs, and the Department of Floriculture and Ornamental Horticulture, sponsor of the junior author prior to his entrance in the armed services of the country; to the heads of these we are obliged for encouragement and material assistance. The drawings are by Florence Mekeel of the Bailey Hortorium staff; all were made from living specimens, and appreciation of her painstaking efforts is freely accorded.

Problems involved

Many difficulties were involved in an attempt to achieve the objectives of this paper. A few are given here for the understanding of students of the ivies. The speciation in Hedera is reasonably sharp. It is in the diagnosing of variants that the taxonomic difficulties arise. Most of these variants are based on foliage differences such as leaf outline, size, venation, or types of variegation. Few variations are clear-cut entities, most of them being sufficiently plastic to be modified by such environmental factors as moisture, nutrients and light as well as by lack of stability in their genetic behavior. None of the horticultural varieties is known to come true from seed. Bud sports are not infrequent and many of these will not produce like plants when propagated by cuttings. Intermediate foliage forms run rampant throughout the group, breaking down artificial differences between the so-called varieties of the trade. Add to these the fact that all of the many foliage variants represent essentially juvenile foliage forms of usually not more than one or two species and one begins to have an insight to the problems involved.

The mature or adult foliage of these species is conspicuously uniform irrespective of the variant from which it developed. In most cases the juvenile leaves are lobed at least basally; the adult foliage of all species is entire or essentially unlobed (Figs. 74, 78). The period of transition from juvenile to adult foliage may be a few months or it may be years, it may be complete for the whole plant or an adult foliaged plant may have young shoots from its base that bear juvenile foliage. Further, the transition between juvenile and adult foliage is accompanied by leaves of varying intermediate stages between the two extremes. Authors have given these intermediate stages varietal names and have treated adult foliage forms as species or varieties distinct from those having juvenile foliage. It should be pointed out that it is not reasonable to expect anyone to identify accurately any ivy on the basis of a single leaf from a plant: a shoot bearing at least eight or ten leaves would constitute a minimum requirement.

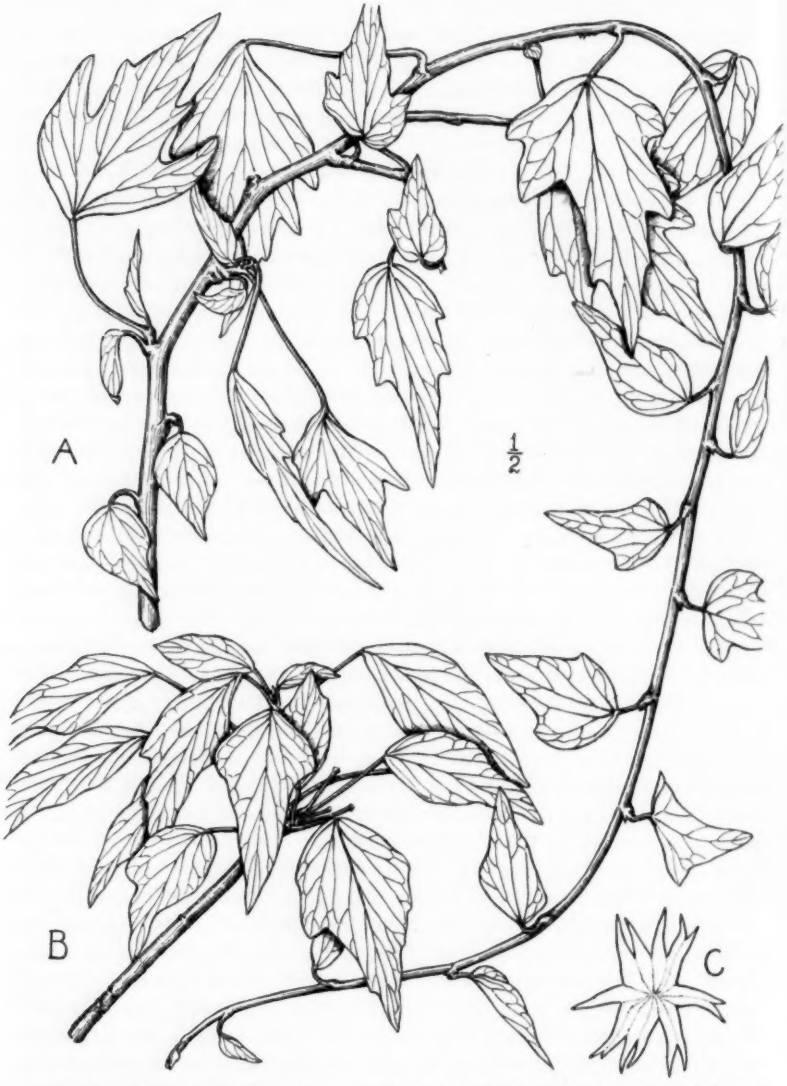
In addition to the complexities inherent in the plants themselves, the problem of correctly identifying the ivies is involved further by the paucity of authentic descriptions of these variants and the almost total absence of type specimens in the world herbaria. This is understandable because these variants were recognized, named and described by horticulturists who had no training in taxonomy and little appreciation of its problems.

Historical review

Accepted botanical nomenclature starts with the works of Carolus Linnæus and notably with the first edition of his Species Plantarum published in 1753. In this work Linnæus assigned two species to the genus Hedera: *Hedera Helix*, the predominant species of English ivy in cultivation, and *H. quinquefolia*, the Virginia creeper, now universally accepted as belonging to Parthenocissus, a genus of Vitaceæ. Knowledge of the English ivies long antedates Linnæus; various kinds of ivies were known to Pliny (about 77 A.D.) and even Linnæus credits his two varieties (unnamed) of *H. Helix* to Caspar Bauhin's Pinax of 1623. It has been noted that variations in ivies receive no mention in most of the books prior to Bauhin, but this is not remarkable inasmuch as these works were largely herbals and concerned with plants of food or purported medicinal value: the ivies belong in neither group. Because Hederas have been described in horticultural literature as well as strictly botanical works, it is necessary and desirable to review the more important horticultural and botanical treatments together.

The first real contribution to our knowledge of the species and botanical varieties of the genus is that by Seemann who, in 1864, recognized three species and distinguished them by the types of epidermal hairs on the flower pedicels, calyces and to a lesser extent on the foliage. Of *Hedera Helix* Linn. he recognized nomenclatorially two varieties, aside from the typical element, one white-fruited and the other yellow-fruited. Later (1868) this paper was published in book form with additions and corrections. It is purely a botanical work and all horticultural clons are omitted. Seemann's paper is of importance because it provides us with what is still the most reliable means of distinguishing the species, a means utilized in this paper.

At this same time (1864) we find Shirley Hibberd writing extensively in Floral World about the ivies. This was not his first venture in print about these plants for in 1858 he published an article on their horticultural background, culture, uses and variation. This earliest article in Floral World is not of immediate concern for no new varieties are purposely named or described and in it Hibberd states that his personal collection is limited to three varieties. In the extended article of 1864 Hibberd named and described fifty-two entities, one of which (*H. æsculifolia*) was not a Hedera at all.



75. Hedera nepalensis, Himalayan or Nepal ivy. A branch with juvenile foliage is shown at A, adult foliage below at B, and a single scale-like hair (× 40) at C.

One of the journals edited by Shirley Hibberd was the Garden Oracle. In the volume for 1870 (pages 123–125) is an article entitled Garden Ivies: Abridged from a Paper communicated to the Linnæan Society. In it he recognized three species and about fifty variants. Bates* placed considerable emphasis on this paper, indicating it to be the starting point of many of the Hibberd varietal names. All of the names used by Hibberd in this paper are either *nomina nuda* or *nomina subnuda* and for this reason the source is not acceptable as the place of their legitimate publication.

In 1872 Hibberd published the culmination of his ivy studies in a book entitled The Ivy, its history, uses and characteristics. This book, based largely on his previous papers, is a small volume containing numerous illustrations and represents a collation of these previous papers with many of the descriptions reprinted *in toto* and others with minor changes. Some of the combinations credited by authors to this book of 1872 were actually made in the earlier papers. Hibberd made no varietal combinations and all his ternary names must be treated as trinomials. Hibberd's book has been thoroughly reviewed recently by Bates. While Bates' review is of aid in pointing out typographical errors of Hibberd's treatise and ably traces the vagaries and obvious shortcomings of the work, many features on the credit side are ignored; these are here given mention.

Bates states that, "to judge the value of his (Hibberd's) work . . . one should take into consideration the idiosyncracies of the man." In his portrayal of Hibberd, Bates indicates him to have been "self-opinionated, . . . proud, . . . set in his ideas even unto stubborness and thoroughly unscientific. These are qualities which prevent a serious consideration of any work which proposes to stand authoritative." Any evaluation of a piece of scientific work must be based on that work. We may not be biased or unduly influenced by an opinion as to the character or degree of stability of its author. Hibberd's treatise must be accepted on its merits. It should be remembered that Hibberd was one of the first (1864) to give names and descriptions to many of our ivies. When those names are identifiable and satisfy the conditions of the International Rules of Botanical Nomenclature, we must accept them without reference to the personality of their author.

In 1867 William Paul, an English nurseryman of importance in his day, published in the Gardeners' Chronicle a list of the garden ivies. Here he gave names and descriptions to thirty-six variants of what he considered to be five species of Hedera. Some of his names were new to science and must be recognized. A year later Paul republished this list in a rearranged format in the Florist and Pomologist. Karl Koch, the noted German botanist, accepted Paul's descriptive list and Koch's German edition of it,

* Bates, A., The Illusive Ivy, in Nat. Hort. Mag. xiii: 241–245, 1934 and xx: 260–262, 1941.

with annotations, appeared in the same year in Wochenschrift für Gärtnerei und Pflanzenkunde, volume 13, 403 (1868).

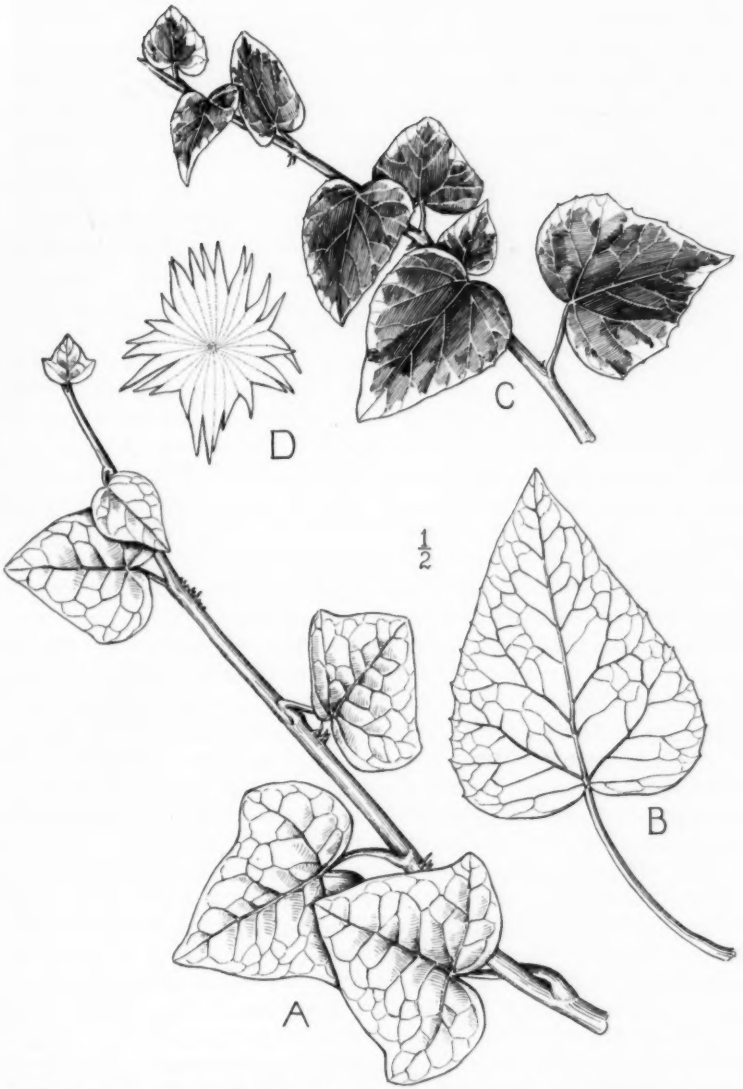
Nicholson's treatment of Hedera in his Illustrated Dictionary of Gardening (1885, not 1886 as cited by Bates) is conservative and of particular value because of its good illustrations. An herbarium collection of Hedera variants made by Nicholson is deposited at the Arnold Arboretum. This collection was prepared in 1880 and before the publication of the Dictionary. Because of this, some authors may have given it much consideration on the assumption that these Kew plants represented the material on which Nicholson based the descriptions in the Dictionary. We do not hold this view and place little value on the label names (written by Nicholson) because in many instances the same variety is represented by several specimens, each bearing a different name. The probability is that Nicholson did not identify these specimens at all, but merely copied on the sheet the label name as it appeared with the plant in the garden. The collection is of significant historical value in indicating the varieties then grown and also is evidence of the fact that as much as sixty years ago the label names on the Hedera collection at Kew were probably anything but reliable.

The renowned French horticulturist, Carrière, published a lengthy list of variants in Revue Horticole (1890), accompanying the polynomials with brief diagnoses. He stated that his diagnoses were not intended to be scientific nor did he intend that the names should be accepted by botanists. Unfortunately one's wishes in such matters cannot be taken into consideration when at the same time the names of the plants are validly and legitimately published. In many cases Carrière's names were legitimately published and we must give them equal consideration with all others.

In 1896 Voss, in Vilmorin's Blumengärtnerei, united all the Hederas into a single species and proposed a new name for the plant now known as var. *hibernica*. Voss recognized only a few of the very outstanding variants, reducing many of these to the rank of *formæ*.

Of the European nurserymen, it is probable that the firm of Haage and Schmidt offered more new variants to the trade than any other. Their catalogues must be consulted by any student of the group, and in them will be found brief descriptions and occasionally an illustration of their new introductions. Unfortunately, no reasonably complete sets of European catalogues are available in this country, but those of the Massachusetts Horticultural Society Library were of special aid in this instance.

The first American treatment of note on the ivies was by Rehder in Bailey's Cyclopedia of American Horticulture (1900). A revision of this appeared fifteen years later in Bailey's Standard Cyclopedia of Horticulture, again by Rehder. All of the species and varieties known then to



76. HEDERA COLCHICA, the Colchis ivy. Juvenile foliage of the typical element is figured at A, leaf of var. *dentata* at B, juvenile foliage of var. *dentato-variegata* at C, and a single hair (× 60) at D.

be domestically available were presumed to be accounted for. In the latter work they numbered three species and twenty-nine varieties.

Fredrich Tobler of the Botanical Institute of Dresden, Germany, published the first comprehensive monograph of the genus in 1912 in a small volume entitled Die Gattung Hedera. Fifteen years later he published a shorter paper (in Mitt. Deutsch. Dendr. Ges., pp. 1–33). The latter consists of an alphabetical enumeration of botanical and horticultural names applied to the species and lesser elements, with an indication of acceptance or rejection by Tobler and often accompanied by notes giving reasons for the treatment accorded individual names. Neither keys nor descriptions are provided.

Bean's treatment in Trees and Shrubs Hardy in the British Isles (1915) is concise with succinct descriptions. Of this reference Bates states, "he had access to both the herbarium there (Kew) and the plants themselves; a fact which should be borne in mind when consulting his work." The justification of placing such emphasis on this situation is open to serious question, for unless the Kew Herbarium and gardens contained the very same plants on which the multitude of names applied to the Hedera variants were originally based, it is of no more value than any other single collection of comparable magnitude. The labels on plants in any botanic garden or nursery are of no greater accuracy than knowledge of the plants permits and the lack of accuracy of labels as far back as Nicholson's time already has been indicated insofar as Hedera is concerned.

Among the latest extensive writings on the ivies are a series of seven miscellaneous articles by Alfred Bates entitled The Illusive Ivy.* These have been published irregularly during the last decade in the National Horticultural Magazine and represent primarily a critical review only of the English literature of the subject, discussions of vernacular named forms and speculations on relationships of existing species and their prehistoric ancestors. Bates' chief contribution to our knowledge of the group, aside from his introduction and description of several new vernacular names, is to add evidence to the known fact that confusion exists and that the nomenclature and taxonomy need thorough study. It may not have been Bates' intent to publish a series of scientific papers because on occasion he stated naively, "if it were possible to import a full collection from some reliable English nursery the difficulty of nomenclature could be straightened out," and in another instance, "I have preferred to follow Bean (author of Trees and Shrubs Hardy in the British Isles) rather than any American writer because this is not an American genus of plants and I consider an European horticulturist to be in the position of being more familiar with them than

*Bates, A., The Illusive Ivy, in Nat. Hort. Mag. xi, 68–76, 213–219 (1932); xiii, 234–245 (1934); xix, 199–220 (1940); xx, 14–20, 260–265 (1941); xxi, 132–144 (1942).

anyone over here." In at least one situation Bates was in error, for he stated, "in the naming of all 'sports' of . . . plants the rules governing the nomenclature call for the use of English and not Latinized names. This rule must apply to ivies also and will be rigidly followed in these papers." At another time he wrote, "as a Latinized name has no standing when given to a horticultural *form*, I wrote to the originator of [var. *Meagheri*] carefully explaining the situation . . ." The facts of the case are that there is nothing in the International Rules of Botanical Nomenclature forbidding the use of Latin names for horticultural subjects, although it is recommended that vernacular names be employed. Nonetheless, if the name of a plant has been validly published and a Latin name was originally given it, the latter is the name of the plant and we may not arbitrarily cast it aside and substitute an English or vernacular name for it. The evidence in support of this is voluminous. It may be that Bates made the mistake of considering a Recommendation, as proposed in the International Rules of Botanical Nomenclature, to be of equal importance with an Article. The Recommendations are suggestions only; the Articles are mandatory and must be followed by supporters of the Rules.

Terminology

No special terms are proposed in this paper. A few of the more common terms are here given a precise connotation. The term *twig* is restricted to the new shoots, the current season's growth; all older stems are referred to as *branches* or *stems*. A brief discussion of the types of hairs on the ivies is given on page 116, following the generic description.

The leaves of variants in the juvenile stage of development are, for the most part, lobed. The central lobe through which the midrib extends is the *terminal lobe*. The two lobes formed by the cordate or hastate character of the base are *basal lobes:* these are sometimes small and thus likely to be overlooked. In a five- or more lobed leaf the lobes between the terminal and basal are called *lateral lobes*. A sinus is a space or cavity. In leaves it is a term applied to the space between two adjacent lobes. In Hedera these sinuses may be rounded or angular. A rounded sinus is one whose base is obtuse and, conversely, in an angular sinus the base is sharp pointed or essentially so. By geometrical definition, an angle greater than a right angle is obtuse, one less than a right angle is acute. Thus, one may have a given leaf with rounded sinuses and the lateral veins forming acute angles with the midrib. Figures indicating leaf size are of the leaf-blade exclusive of its petiole. They are of the entire blade including its basal lobes and not of the midrib only as are the measurements given by Bates in his miscellaneous papers.

THE SPECIES AND VARIETIES

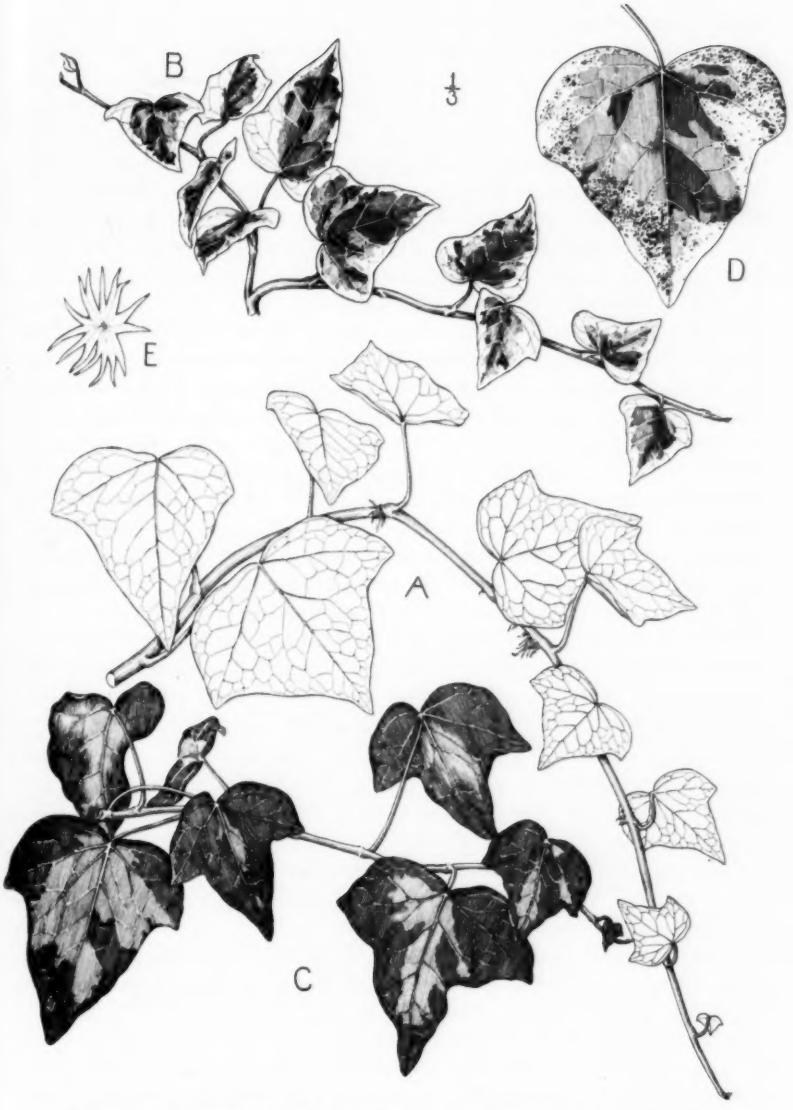
HEDERA Linn. Sp. Pl. Ed. 1, p. 202 (1753).

Woody scandent plants becoming arborescent at maturity; the two stages usually distinct; the scandent juvenile stage has climbing stems supported by aerial rootlets that are present in varying degrees of abundance and the shrubby stage that has no aerial rootlets: leaves alternate, petioled, simple, in juvenile stages usually conspicuously lobed or strongly cordate but becoming entire with cordate, obtuse or broadly cuneate bases at adult stage (not to be confused with the mature stage of a leaf in a given season), glabrous or hairy above, upper surface usually waxy and somewhat glossy, lower surface minutely stellate-hairy or scaly: flowers perfect, subtended by caducous bracts about 1 mm. long, in umbels arranged solitary or compounded in terminal panicles or racemes; pedicels or rays stellate-hairy or scaly, not jointed; calyx with 5 lobes or teeth; petals 5, yellowish-green, usually 1–3 mm. long, margins valvate; stamens 5, alternate with petals; ovary 5-, rarely 4–celled and each cell ovuled, half-inferior, terminated by a convex disc having 5 or 10 often obscure radiating ribs, styles connate and fused in a single short column terminated by an obscurely 5-lobed stigma: fruit a 4–5-seeded subglobose berry-like drupe, turbinate or flattened on top with persisting style remains, usually 4–7 mm. in diameter; normally blackish at maturity, but in some species or varieties orange, yellow and pale cream-colored fruits have been reported.

The five species are native in Europe, Asia and North Africa.

Hedera (Hed′-er-a) is the classical name for the ivy and is of ancient Greek origin.

As previously noted, some species of Hedera are separable by the character of hairs on the lower side of the foliage and fruit-stalks. These hairs are small (Figs. 75-77) and a magnifying lens of 10 power or more is needed to note the number of rays of each hair and often to determine the type of hair. Hairs of *H. Helix*, the species most commonly encountered in cultivation, are strictly stellate; that is, they are composed of a number of slender branches all united at a common point. They look like forked or branched hairs with the radiating branches elevated from the surface on which they are borne. In the other species of Hedera the hairs are scaly or scale-like (by some authors the term lepidote is erroneously employed), and by this is meant that they have a flattened body from which radiate short flattened fingers, the latter simple or branched. Actually this flattened body represents the fused basal portions of the radiating hairs. Contrary to the condition found with the stellate hairs, these flattened branches of the scale generally lie flat and are appressed to the surface. In mature leaves it will be noted that the upper surface is often essentially glabrous but it is apparent from a study of the development of such leaves that their upper surface originally had as many hairs or scales as the lower, those of the upper side becoming deciduous toward leaf maturity.



77. HEDERA CANARIENSIS, Algerian ivy. Juvenile foliage; A, typical element; B. var. *variegata;* C, var. *striata;* D. var. *margino-maculata;* E, scale-like hair (× 60).

The species, or their typical elements, are not as commonly cultivated as are their variants. It is primarily the taxonomy of the latter that now concerns us. In the trade they are called varieties, but the varietal names applied are often of two or three separate words. The rules of nomenclature do not permit acceptance of Latin names of more than one word for any category whether it be a species, variety or other. There is an exception to this rule and that is that two words may be used if hyphenated into one by their author. Admittedly, many of the ivies in cultivation represent minor variations of more stable variants, as for example, most of the variegated leaved sorts are color forms of some particular leaf type. To treat all forms below the rank of species as varieties (Latin, *varietas*) loses any indication of this relationship in the name and tacitly admits consideration, nomenclatorially at least, that all the varieties are of equal rank, although from the outset the contrary is known to be true. On the other hand, no horticulturist will look at a variegated ivy and tell a prospective customer that it is *Hedera Helix* var. *hibernica* forma *maculata*, nor would it be so written in any trade catalogue. To go beyond the trinomial is more than the horticulturist will do, in practice if not in principle. Inasmuch as the avowed purpose of nomenclature is to provide names by which to designate the plants with which we work, it is not necessary that a name indicate the lineage of the plant concerned. From this it might be argued that it would serve the same purpose to give all variants binomials and treat them as species. So it would, save for the fact that by universal accord species are judgments embodying individual philosophies and the units we consider here to be of less than specific rank do not fit those judgments: they are of less significance and magnitude than species. Moreover, species are the dominant units in nature, propagating themselves by seeds.

Categories of less than species rank have by no means been interpreted alike by either botanists or horticulturists, and the use of the terms subspecies, variety and forma are widely divergent in application.* For simplicity of nomenclature and directness of approach it seems best to treat horticultural forms of English ivy below the rank of species as varieties and to endorse the recognition of only a single category (*varietas*) below that of species for horticultural practices.

As previously mentioned, the taxonomy of these variants is as confusing as is their nomenclature. In their juvenile stage of development all the ivies are scandent (except in two Latin-named clons) and their stems have aerial rootlets. The stems are said to be "dorsi-ventral," meaning that the leaves usually lie in a single plane. These climbing plants on occasion produce stout erect or ascending branches having no aerial rootlets and whose

* For full discussion see Journ. Arnold Arb. viii, 56–68 (1927); x, 65–68 (1929); and Rhodora, xlii, 239–246 (1940); xliii, 157–167 (1941); xliv, 153–167 (1942).

foliage is different. It is on these latter branches that the flowers and fruit are borne and are referred to in this paper as representing the "adult stage." Significantly, all juvenile foliage types of a given species develop into adult stages having similar foliage and from the latter it is usually not possible to tell from what "variety" or leaf form it originated. Botanically this condition is of no taxonomic importance but horticulturally it assumes much magnitude when it is realized that vegetative propagation of these "adult" branches results in plants that are distinctly shrubby and, growing to considerable size, lose all resemblance to the vine from which they were taken. On viewing such an erect shrub there is no hesitancy in calling it a distinct variety and it is readily understood why, in the past, horticulturists have given them specific or varietal rank apart from other ivies. Knowing the genetic origin of this arborescent plant there is disharmony in giving two parts of a single plant two names. For this reason the names heretofore applied to individuals of the arborescent stage are here placed arbitrarily in synonymy under the typical element of the species.

It is not customary, and in fact is contrary to the Recommendations of the Rules, to include misidentifications in synonymy and were this paper intended only for botanists the recommendation would be followed. However, many of the trade names of ivies are illegitimate as well as invalid. Many of the older literature names are technically illegitimate because they were published as quadrinomials, or naked names never accompanied by descriptions (*nomina nuda*) or even by brief inadequate descriptions (*nomina subnuda*), or they were published as label names in synonymy.*

* It should be pointed out that the Rules of Nomenclature contradict themselves with respect to the method of selecting the valid name for plants in categories below that of species. According to Rehder's interpretation of Art. 55, part two, one must accept the oldest legitimate name that is available irrespective of the category in which it was published originally, or even if no category were indicated. For example, the common variegated form of *Hedera Helix* is widely known as "marginata." The oldest name for it is *Hedera arborea variegata*, a trinomial. According to Rehder, the correct ternary name for the plant, irrespective of the category, would be "variegata." However, Art. 16, part three, states "in species and groups of lower rank, the valid name is the binary or ternary combination containing the earliest epithet published with the same rank, provided that this combination is in conformity with the Rules of Nomenclature." According to this rule, the correct name for the plant mentioned above would be *Hedera Helix* var. *Cavendishii*. Rehder bases his interpretation on the lack of explicitness of Art. 55 (2) which states "when the epithet of a subdivision of a species, on transference to another species, has been applied erroneously in its new position to a different plant, the new combination must be retained for the plant on which the group was originally based," and also on the absence of any examples of transfers of valid names of groups below the species when a change of rank is involved. Rehder's interpretation has much merit and indicates a sensible and practical course, but it is not in agreement with Art. 16 quoted or with Art. 58 which states flatly "when a group changes its name, the earliest . . . name or epithet given to the group in its new rank is valid. . ." To follow Rehder's interpretation would involve changing the established names of six varieties of *Hedera Helix* and because there is a question of validity we prefer not to adopt this view in the present paper.

Inasmuch as many of these names still persist in our horticultural literature or are used in labelling plants, it is in the spirit of completeness that they are here included in synonymy whenever identifiable with recognized variants.

Types of all entities recognized in this paper as new are deposited in the herbarium of the Bailey Hortorium and in most cases co-types have been deposited also in the herbarium of the Arnold Arboretum. Specimens of all the accessions in the living collection at Cornell University (as of October 1, 1942) have been prepared and deposited in the herbarium at the Bailey Hortorium.

Key to the species

1. Twigs radial, adhesive or aerial rootlets absent (adult stage).
   2. Hairs stellate, rays 4–10 (rarely to 14)..... V. *H. Helix*
   2. Hairs mostly scale-like, rays 8–30.
      3. Twigs and petioles usually burgundy-red; leaf-blade comparatively thin; vesture of scale-like and stellate hairs..... III. *H. canariensis*
      3. Twigs and petioles green; leaf-blades distinctly coriaceous; vesture of scale-like hairs.
         4. Leaf-blades ovate with broadly cuneate to cordate bases, having strong celery-like or umbelliferous odor when crushed; hairs having mostly 20–25 rays..... II. *H. colchica*
         4. Leaf-blades usually elliptic-lanceolate with cuneate base, not at all or only slightly odoriferous when crushed; hairs having mostly 15–20 rays.
            5. Fruit orange; flowers with ovary slightly elevated above base of calyx-lobes; leaves usually 1–4 inches long, much longer than wide..... I. *H. nepalensis*
            5. Fruit black; flowers with ovary considerably elevated and appearing as a hemisphere above base of calyx-lobes; leaves usually ¾–1½ inches long, not much longer than wide. ..... IV. *H. rhombea*

1. Twigs dorsi-ventral, adhesive or aerial rootlets present, usually at or near the leaf nodes (juvenile stage).
   6. Hairs all stellate, rays 4–10 (rarely to 14)..... V. *H. Helix*
   6. Hairs all scale-like or hairs of both scale-like and stellate types present.
      7. Leaf-blades triangular-ovate to triangular-lanceolate, unlobed or with 1–10 pinnate lobes or teeth along the sides..... I. *H. nepalensis*
      7. Leaf-blades usually broadly ovate, entire or with a few palmate lobes.
         8. Twigs and petioles usually burgundy-red; leaf-blades thin and usually glossy; leaves only slightly odorous when crushed; hairs predominantly with 15 rays (varying from 13–22), both scale-like and stellate types present..... III. *H. canariensis*
         8. Twigs and petioles green; leaf-blades thick and leathery, often dull; hairs all scale-like.
            9. Leaves entire or slightly lobed, having strong celery-like or umbelliferous odor when crushed, usually 3–10 inches long..... II. *H. colchica*
            9. Leaves 3–5-lobed, not or only slightly odorous when crushed, usually 1–4 inches long..... IV. *H. rhombea*

I. Hedera nepalensis K. Koch, Hort. Dendrol. 284 (1853). NEPAL IVY. Fig. 75.

H. Helix Wallich, in Roxb. Fl. Ind. ii, 515 (1824), non Linn.

H. Helix Linn. *β chrysocarpa* DC. Prod. iv, 261 (1830).

H. Helix himalaica Hibb. in Fl. World, vii, 57 (1864).

H. Helix chrysocarpa Hibb. op. cit., 58, not The Ivy (1872).

H. colchica K. Koch sensu Seemann, Rev. Nat. Ord. Heder., 31 (1868), non Seemann 1864.

H. Helix cinerea Hibb., The Ivy, 71 (1872).

H. himalaica Tobler, Gatt. Hedera, 67 (1912).

H. cinerea Bean, Trees & Shrubs Brit. Isl. i, 608 (1914).

Both juvenile and adult stages of foliage and development seen. Twigs of juvenile stage reddish, slender; aerial rootlets present and usually immediately below each node; hairs scaly, predominantly 12–15-rayed, yellowish-brown, averaging 0.2 mm. in length, abundant on twigs and petioles but sparse on foliage and usually absent on mature leaves: juvenile leaves 3.5–10 cm. long, thinly coriaceous, gray-green above, lighter beneath, very variable in outline on any given plant, being ovate-triangular, deltoid or elliptic-lanceolate; margins entire to deeply obtuse-lobed, number of lobes varying from 1 to 5 on each side of the blade; apices acute or obtuse; bases usually cuneate, occasionally obtuse or shallowly cordate; veins slightly raised, light green and paler than the blade, delicate, abundantly anastomosing; petioles 1.5–7 cm. long: adult leaves elliptic to elliptic-lanceolate, usually 2.5–12 cm. long, acutish to strongly acuminate; margins entire, unlobed, occasionally obtusely and remotely coarse-toothed or somewhat undulate: umbels in racemes or corymbose panicles, about 2.5 cm. across, of 8–20 rays, peduncles short and stout, rays and peduncles very scaly: fruit large, about 1 cm. in diameter, color orange-chrome (Ridgway) or marigold-orange (Roy. Hort. Soc. color chart).

Koch based his name *Hedera nepalensis* on the description of Wallich in Roxburgh's Flora of India wherein the plant is said to have come from Nepal, India. Wallich's type (according to Tobler, specimen no. 4908 A) has not been seen; it is to be sought in the Kew herbaria where his specimens are known to be deposited.

Hedera nepalensis occurs naturally in Asia from Afghanistan to Kashmir, northwestern and western Himalaya to Pundjab and Nepal, throughout Sikkim to Assam and Copya-Hills of Arakan.

DeCandolle was the first to recognize this plant as nomenclatorially different from typical *Hedera Helix* Linn., crediting it as originating in northern India and in contrasting it with the latter said, "differs in its great stature, in the base of its leaves much more strongly cuneate, its lepidote pedicels and fruits yellow" (translation ours). Hibberd in 1864 called this plant *H. Helix himalaica* and in 1872 for no apparent reason placed the latter in synonomy and substituted the varietal name of *cinerea*.

Tobler ignores Koch's name for the species, and proposes *Hedera himalaica* as a new name without discussion of the case.

The species is readily distinguished by its characteristic juvenile foliage (Fig. 75) wherein the leaves are elliptic-lanceolate in outline, of a dull green color mottled with small interstitial zones of greenish-gray between the lateral veins, and with 2 to 4 narrow lobes on each side of the leaf. Young leaves or leaves of young seedlings do not always show this characteristic lobing. On the petioles of young leaves and along the distal ends of twigs are to be sought the brown multi-rayed scale-like hairs (Fig. 75-C) that lie flat on the surface and porrect as in the stellate hairs of *Hedera Helix*. The adult foliage stage is distinguished from the related *H. colchica* by its narrowly cuneate leaf-bases and by the fact that in *H. colchica* the leaves emit a pungent carrot-like or umbelliferous odor when crushed; the odor is not conspicuous in *H. nepalensis*. Pot-grown plants in the Cornell collection have been observed in flower and fruit and the marigold-orange color of the latter readily distinguishes the species from other closely related entities. The Poets ivy, *Hedera Helix* var. *poetica*, also produces yellow fruit but the broadly ovate adult foliage of the latter is not likely to be confused with that of *H. nepalensis*.

The Nepal ivy is not as hardy as *Hedera Helix* and should not be expected to survive winters comparable to those of Ithaca, New York. It is not commonly cultivated, although offered to the American trade by at least two firms as "Oak-leaved" ivy and plants received from a third as *H. hibernica* were typical *H. nepalensis*. It is not now known to be offered under its own name.

Tobler (1912) described a var. *sinensis* of this species. It differs from the typical element in its juvenile foliage consisting of entire or three-lobed leaves. Handel-Mazzetti raised this Chinese plant to specific rank, but Rehder has since treated it as a variety. Material of it has been seen from cultivation, but the plant does not appear to be in the domestic trade.

II. **Hedera colchica** K. Koch, in Wochenschr. f. Gart. u. Pflanzk., 1859, p. 76. Colchis Ivy. Fig. 76.

H. Helix Linn. *β colchica* K. Koch, in Linnæa, xvi, 365 (1842).

H. Regneriana Hibb. in Fl. World, i, 138 (1858), *nomen subnudum*;* op. cit. vii, 57 (1864).

H. Regneriana arborea Hibb. op. cit. vii, 57, *nomen subnudum*.

H. cordifolia Hibb. op. cit. vii, 57.

H. colchica Koch var. *arborescens* Paul, in Gard. Chron., 1867, p. 1215.

H. coriacea Hibb., The Ivy, 105 (1872).

* Named for Roegner, superintendent of the Botanic Garden at Odessa (about 1840).

H. coriacea dendroides Hibb. op. cit., 107.

H. colchica β rhombifolia Boiss., Fl. Orient. ii, 1091 (1872).

H. rhombifolia Rupr. ex Boiss. l.c., *pro syn.*

H. Helix Rægneriana Nichols., Ill. Dict. Gard. ii, 121 (1885).

Juvenile and adult stages examined. Twigs pea-green, very stout, densely scaly; scales yellow, predominantly about 20-rayed but number of rays varying from 18–30: leaves thickly coriaceous, emitting a characteristic odor when crushed that is suggestive of celery or other umbelliferous plants; veins green, as viewed from above distinctly raised near base and becoming depressed toward apex and margins, surface ribbed throughout on lower side: leaves of juvenile foliage broadly ovate, occasionally 3-lobed, usually 5–15 cm. long; margins entire; bases shallowly cordate to very broadly cuneate; apices acute to abruptly acuminate; mature leaves glabrous or essentially so on both surfaces, young emerging leaves usually scaly above and beneath: leaves of adult foliage ovate to ovate-orbicular, bases usually broadly cuneate to cordate, not differing essentially from juvenile foliage except in absence of lobes and generally narrower outline: umbels of 6–18 rays, mostly 1.3–2.0 cm. across, rays or pedicels stout and densely scaly; flowers with conspicuous calyx, the lobes triangular-ovate: fruit blue-black at maturity, about 6–8 mm. across, those on our specimens without viable seeds.

Koch first designated this plant as a variety of *Hedera Helix* Linn. A year before Koch raised it to specific rank, Shirley Hibberd mentioned casually an ivy that he called *Hedera Regneriana* and published a woodcut of the leaf in the same article on page 133 of Floral World (1858). It may be our *H. colchica* although neither Hibberd's description nor figure are sufficient to characterize the plant. Hibberd's name has no botanical standing as that of date. However, he did give a better description of his *H. Regneriana* in his 1864 paper, but this was five years after Koch established the name *Hedera colchica.* Despite this, Hibberd's illegitimate name still persists on nursery stock and in a few trade-lists.

The material on which Koch based this species came from the eastern shore of the Black Sea on the south side of the Caucasus Mountains in Transcaucasus and presumably from a forested area.

The species is native throughout much of southeastern Europe and Asia Minor, extending southeastward from the Russian states in the Caucasus and Transcaucasus areas through Syria, Turkey and to northern Iran. Its habitat is reported by Tobler (1912) to be in the dense hardwood forests where it grows on the trunks of beeches, chestnuts and oaks. It is distributed over areas from sea level to elevations of 4,000 feet.

In its scandent form, typical *Hedera colchica* is readily distinguished from other ivies by its thick dull dark green leaves and pea-green petioles and twigs. It is not commonly cultivated, but specimens in the Cornell collection were acquired under the name *Hedera amurensis:* the name has no botanical standing.

Key to the varieties of *colchica:*

1. Leaves with entire margins ..... typical element
1. Leaves with remotely denticulate margins.
   2. Foliage not variegated, uniformly green ..... var. *dentata*
   2. Foliage variegated ivory to cream-color, at least marginally . var. *dentato-variegata*

† **H. colchica** var. **dentata** (Hibb.) Lawr. stat. nov. Fig. 76-B.

H. coriacea dentata Hibb., The Ivy, 106 (1872).

H. Helix dentata Nichols., Ill. Dict. Gard. ii, 121 (1885).

H. colchica f. *dentata* Hibb. in Journ. Roy. Hort. Soc. xii, 395 (1890).

All specimens examined were of the juvenile stage. They differed from typical scandent plants of *H. colchica* only in the remotely denticulate leaf-margins (Fig. 76-B). It is as common in cultivation as the typical material and is known also from the wild as evidenced by specimens in the Arnold Arboretum herbarium from the Province of Batum, adjoining the Black Sea.

This variety is grown under the name of "Bullocks-heart ivy" in England where it serves as a ground-cover in much the same manner as does *Hedera Helix* in this country.

† **H. colchica** var. **dentato-variegata** Schulze, var. nov. Fig. 76-C.

Differt ab *Hedera colchica* foliis ochroleuco marginatis et marginibus remotius denticulatis.

This variant, botanically only a variegated form of var. *dentata* and here placed in the category of *varietas* for reasons given on page 118, has been distributed in the trade as *Hedera colchica dentata variegata* for a considerable period. No record has been found in the literature of its ever having been formally described. As indicated in Fig. 76-C, the leaves are predominantly green with the cream-colored variegation confined to the marginal areas.

III. **Hedera canariensis** Willd. in Magazin, Gesellschaft Naturforschender Freunde zu Berlin, ii, 170 (1808). ALGERIAN IVY. Fig. 77.

H. Helix Linn. *β? canariensis* DC. Prod. iv, 261 (1830).

H. Algeriensis Hibb. in Fl. World, vii, 57 (1864).

H. canariensis var. *arborescens* Paul, in Gard. Chron., 1867, p. 1217.

H. maderensis K. Koch, Dendr. i, 680 (1869), *pro syn.*

H. grandifolia Hibb., The Ivy, 96 (1872), *pro parte.*

H. azorica Carr. in Rev. Hort. lxii, 163 (1890).

H. sevillana C. Sprenger, in Gartenwelt, vii, 244 (1903).

H. canariensis var. *azorica* Bean, Trees & Shrubs Brit. Isl. i, 601 (1914).

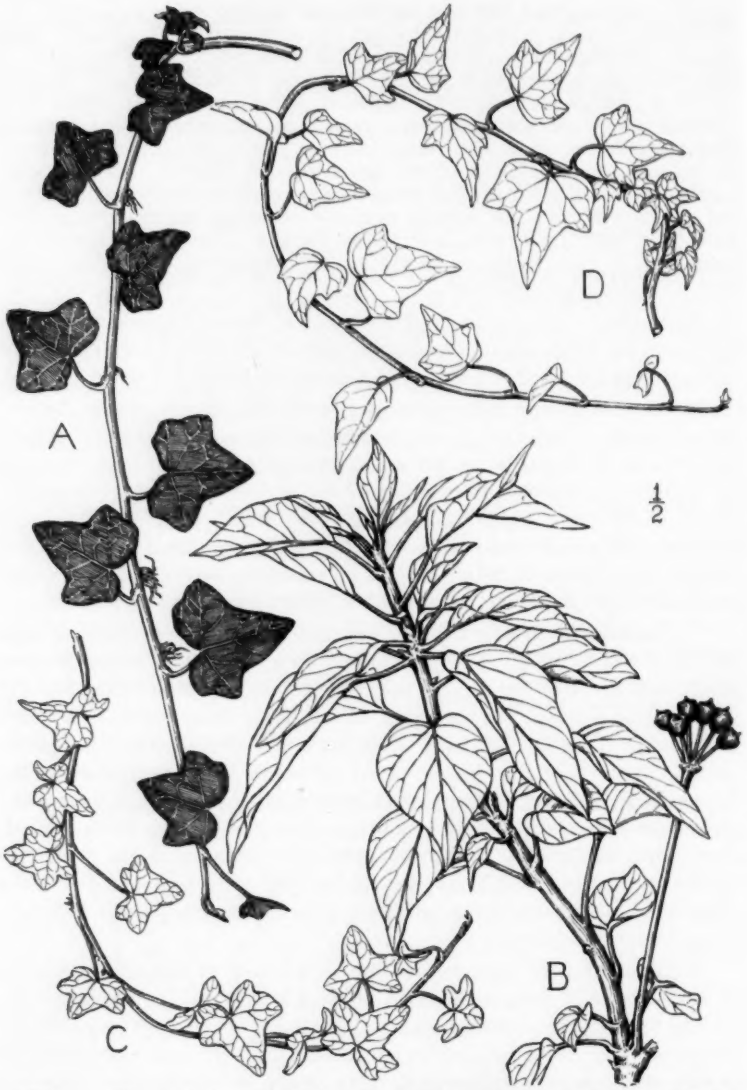
Juvenile and adult foliaged specimens examined. Scales grayish-white, usually 15-rayed but the number of rays varying from 13–22 and occasionally showing a tendency toward the stellate type of vesture: twigs slender, dull burgundy-red (some variants have green twigs), glabrous at maturity, grayish lenticels prominent, aerial rootlets few and remote: leaves of juvenile stage ovate-triangular to deltoid, unlobed or shortly 3–5-lobed or rarely with 7 lobes, usually 5–15 cm. across, glabrous or very young leaves somewhat scaly, the scales becoming early deciduous on mature foliage and twigs: leaves of adult stage ovate and unlobed, slightly thicker and less glossy than of juvenile stage, base obtuse to deeply cordate, apex acute: flowering material has not been seen: fruiting specimens examined have large black fruits 6–10 mm. across, usually 12–20 in each umbel, the umbels 2.4–3.8 cm. across on stout elongated peduncles, both pedicels and peduncles scaly-stellate-hairy.

Willdenow's type specimen of *Hedera canariensis* is based on a collection made by Broussonet in the Canary Islands. It has not been seen by us but is to be sought in the Willdenow herbarium at Berlin-Dahlem, Germany.

In nature, *Hedera canariensis* grows on the islands of the Azores, Canaries and on Madeira. Despite occasional statements to the contrary, Tobler tells us that it is not known to have been collected from Portugal or Spain in continental Europe. However, it does occur in northwestern Africa, in Morocco, Algiers and eastward into Tripoli. In Tripoli it may be only an escape from cultivation. The ivy naturalized in Egypt and frequently determined as *H. canariensis* is, according to Tobler (1912), what we know as *H. Helix* var. *poetica* and introduced to Egypt from Greece.

The species, at least in its juvenile stage, is readily distinguished from all other ivies by its usually burgundy-red twigs and petioles and the very glossy light green leaf-blades. As noted by Tobler, the adult foliage form of *H. canariensis* is not always easily distinguished from that of *H. Helix* although in *H. canariensis* most of the leaves are broadly ovate and rarely cuneate at the base. The nature of the epidermal hairs, as outlined in the key on page 120, will aid further in separating the species when foliage characters appear to intergrade. That the two species, *H. Helix* and *H. canariensis*, are of close affinity is without question: that there are two species and not one is quite another matter, but for the present and in the absence of further conflicting evidence it seems most expedient to retain them as separate entities.

Nicholson did not consider the variegated clons of this species worthy of nomenclatorial recognition, because, in his opinion, they reverted too readily to the type. Hibberd segregated still another which he called *H. grandifolia* var. *canescens*, but his contention that the variegation was due to the existence of a golden-gray waxy bloom is incompatible with our knowledge of foliage variegation in Hedera and no disposition is made of the name.



78. HEDERA HELIX. A, juvenile foliage of typical element; B, adult foliage of fruiting branch; C, var. *walthamensis;* D, var. *gracilis.*

The Algerian ivy is grown in northeastern United States primarily as a conservatory and house plant and is not known to be hardy in Ithaca except when grown as a ground-cover and given winter protection. The species is a very vigorous grower, even in the case of the variegated clons, and is reported to be a high-climbing vine in nature.

The species, *Hedera canariensis*, may be subdivided into six units, as follows:

1. Plants with uniformly green foliage; twigs and petioles burgundy-red. ..... typical element
1. Plants with leaves variously variegated; twigs and petioles burgundy-red or green.
   2. Petioles and twigs green.
      3. Leaves pale green with darker network of veins and often with cream-colored variegated areas; blades often digitate in outline..... var. *viridis*
      3. Leaves uniformly variegated with ivory to cream-colored margins, occasionally some leaves all white..... var. CANARY CREAM
   2. Petioles and usually the twigs burgundy-red: leaves various.
      4. Leaves dark green marginally; mid-section of blade streaked with light green or ivory..... var. *striata*
      4. Leaves cream-colored or ivory variegated along margin, usually broadly so; mid-section chlorophyll-bearing.
         5. Margins cream- or ivory-color; mid-section usually a blue- or gray-green..... var. *variegata*
         5. Margins flecked or spattered with green; mid-sections usually of a yellowish-green..... var. *margino-maculata*

H. canariensis, typical element. Fig. 77-A.

The synonymy and description provided on page 125 applies strictly to this element.

† **H. canariensis** var. **viridis** (Hibb.) Lawr. stat. nov.

? *H. canariensis aureo maculata* Paul, in Gard. Chron., 1867, p. 1215.

H. grandifolia viridis Hibb, The Ivy, 98 (1872).

H. grandifolia pallida Hibb. l.c.

Twigs and petioles green; hairs mostly scaly, usually 12–16-rayed: leaves broadly ovate, often digitately and shallowly 3–5-lobed, light pea-green in color with a darker reticulation of the veins, some or all leaves with large cream- or ivory-colored variegated areas, these never strictly marginal.

Conspicuous in the collection of *H. canariensis* clons for its pale green leaves and twigs, this variant is not commonly cultivated and we do not know of any domestic dealer offering it.

† **H. canariensis** var. CANARY CREAM.

Similar to var. *viridis* in its green twigs and petioles, but differing in its smaller non-digitate foliage in which the leaves are marginally variegated cream- or ivory-color, or some of the leaves without any green color.

A search of the literature failed to reveal any name or description ap-

plicable to this plant. Because of its distinctness and because it is in cultivation we have chosen to give it the new name of Canary Cream. Stock in the Cornell collection was received as *H. Helix maculata*, a name properly applied to a variegated clon of *H. Helix* var. *hibernica*.

† **H. canariensis** var. **striata** Lawr. var. nov. Fig. 77-C.

Petiolis rubrescentibus: foliis margines nigro-viridibus, particularis medio læte viridibus vel ochroleuco-striatis.

Twigs and petioles burgundy-red: leaves dark glossy-green except for the mid-section which is streaked very light green or ivory. The mid-rib and primary veins within the variegated zone are often cream-colored: margins not variegated.

Neither Paul nor Hibberd described this clon and we find ourselves with a very distinct and undescribed variant of the Algerian ivy. It is named var. *striata* because, although the margins are always dark green, the mid-section is streaked pale green or ivory-color. Our plants of this variant were received as "Hedera Helix, large-leaved" from the Westover Nursery Company, University City, Missouri.

† **H. canariensis** var. **variegata** (Paul) Schulze, stat. nov. Fig. 77-B.

H. algeriensis variegata Paul, in Gard. Chron., 1867, p. 1215.

H. grandifolia variegata Hibb., The Ivy, 28 (1872), *pro parte*.

Plants resembling the juvenile stage of typical *H. canariensis* in their burgundy-red twigs and petioles, but differing in the leaf-blades marginally variegated ivory-cream as indicated in Fig. 77. The chlorophyll-bearing mid-section of the blade is usually of a distinct green with a blue- or gray-green zone between it and the ivory margin quite different from that in *H. Helix* var. *Cavendishii* with which it might otherwise superficially be confused.

In some respects this plant is similar to the clon Canary Cream, but differs in the possession of the red twigs and petioles. It is not uncommon in cultivation, particularly along the Pacific Coastal areas. This plant has been known and distributed as var. Gloire de Marengo. We do not know the origin of the latter name nor of its occurence in any but the more recent horticultural literature.

† **H. canariensis** var. **margino-maculata** Lawr. var. nov. Fig. 77-D.

Ramis et petiolis rubrescentibus: foliis ovatis, trilobatis vel non lobatis; marginibus variegatis albis vel ochroleucis et valde maculatis viridi colore.

Twigs and petioles burgundy-red: leaves ovate, entire or 3-lobed; margins variegated ivory-color and prominently flecked and spattered with green.

This variant is superficially similar to var. *variegata* but differs primarily in that the light cream-colored marginal areas are flecked and marbelled with a dull green. On some leaves the flecking is sparse while on others or

on other parts of the same leaf the markings are so dense as to become confluent. The green central portion of the leaf is more yellowish and dull, lacking the contrast so conspicuous in var. *variegata*. The plants on which the variety is based were received from the Brooklyn Botanical Garden as "Hedera Helix var. maderensis variegata."

IV. **Hedera rhombea** (Miq.) Bean, Trees & Shrubs Brit. Isl. i, 609 (1914). JAPANESE IVY.

H. Helix Thunb., Fl. Jap., 102 (1784), non Linn.

H. rhombea Sieb. & Zucc. in Abh. Math.-Phys. Akad. Wiss. München. iv, pt. 2, 202 (1845) *pro parte, nomen nudum.*

H. Helix rhombea Miq. in Ann. Mus. Bot. Lugd.-Bat. i, 13 (1863).

H. colchica Seemann, in Journ. Bot. ii, 307 (1864), non Koch et non Seem. 1868.

H. japonica Paul, in Gard. Chron., 1867, p. 1215, non Jungh.

H. Helix var. *japonica* Lavallée, Arb. Segrez., 126 (1877), *nomen nudum.*

H. Helix var. *colchica* Makino, in Tokyo Bot. Mag. viii, 300 (1884), non Koch.

H. japonica Tobler, Gatt. Hedera, 84 (1912).

H. Tobleri Nakai, Fl. Sylv. Koreana, pt. xvi, 42 (1927).

Plants with leaves glossy green above, the veins depressed; hairs grayish-brown, mostly scaly and with 7–14 rays: leaves of the juvenile or scandent stage shallowly and obtusely 3–5-lobed, usually 2–7 cm. across, very broadly ovate to subreniform in outline; bases usually broadly and shallowly cordate; apices mostly acuminate, often abruptly and obtusely so: leaves of adult or arborescent stage unlobed, ovate-lanceolate or obtusely rhombic in outline, usually 3–7 cm. long; bases cuneate; apices mostly acuminate: umbels 12–30-rayed, in corymbose panicles; pedicels short and slender on somewhat elongated stout peduncles; flowers greenish: fruit 8–10 mm. across, black, globose or depressed-globose.

The specific name of this plant has been much confused, as evidenced by its synonymy. A concise explanation of its early nomenclatorial history is provided by Nakai in his Flora Sylvatica Koreana (1927) and from which we quote:

"Siebold and Zuccarini's *Hedera rhombea* is, not only nomen nudum, but consists of 2 different species belonging to distinct genera: but they are the flowering branch of the Japanese *Hedera* and fruiting specimen of *Textoria trifida* (*Gilibertia trifida*). The type specimen is in the Rijksherbarium at Leiden. They distributed the same set to the Paris Museum and the Gray Herbarium. I have given up *Hedera japonica* Tobler, because the same name was already used by Junghuhn to denote *Textoria trifida* and by Paul and Siebold to the Japanese *Hedera*."

It should be pointed out that Nakai in 1924 (Journ. Arn. Arb. v, 24–27) treated the Hederas of Imperial Japan as comprising three species, *H. pedunculata* Nakai, *H. formosana* Nakai and *H. japonica* Tobler. His characters distinguishing the last two are very close and appear to intergrade. Of these, only the last is known to be cultivated domestically. In the above quotation, Nakai by inference excludes Paul's and Siebold's *Hedera iaponica* from his *H. Tobleri*, yet he cites their names in synonymy under the latter.

Nakai's coinage of the name *Hedera Tobleri* is based apparently on his refusal to recognize as valid Bean's description of the plant under the name of *H. rhombea*. Bean credits the name to Siebold and it is admitted that the diagnosis is very brief and sketchy. Nonetheless his placing the plant as coming from Japan leaves no doubt as to the species concerned and, although there was no intention on the part of Bean to provide an original description for the plant, one is obliged to accept it as the first description for the species under a valid name.

The natural range of distribution of the Japanese ivy is confined to the central islands of the archipelago from Kyushu north to, but not including, Hokkiado (Yezo) and westward through the southern portion of the Korean peninsula. Nakai does not tell us the habitat in which it is to be sought.

We have called this the Japanese ivy. It is so referred by several English authors and horticulturists, including William Paul and W. J. Bean and has been so known for at least a century. The name is appropriate and has meaning. The current edition of Standardized Plant Names would prefer that it be called Tallclimbing ivy, a name of its editor's coinage. This name has neither historical nor morphological significance inasmuch as three other cultivated species of Hedera are specifically described in the literature as being tall or high climbing (*H. canariensis*, *H. colchica* and *H. nepalensis*). It may be contended that the name "Japanese ivy" also is ambiguous due to the presence of two other species of Hedera native in Japan, but in this respect attention should be drawn to the fact that neither is known to be in cultivation and neither is an old nor proved species.

Key to the varieties of *H. rhombea:*

1. Leaves green ..... typical element
1. Leaves marginally variegated with white or pale ivory ..... var. *variegata*

H. rhombea, typical element.

The description given above for the juvenile condition of the species meets the characterization of the typical element; likewise, the synonymy given under the binomial is limited to this typical element in application.

It should be noted that the terminal lobe of the leaves of the juvenile

stage, while not particularly conspicuous, is larger than are the lateral lobes and occasionally it may be irregularly and obtusely toothed.

† **H. rhombea** var. **variegata** (Paul) Schulze, trans. nov.

H. japonica Paul var. *variegata* Paul, in Gard. Chron., 1867, p. 1215.

H. Helix sub-marginata Hibb., The Ivy, 80 (1872).

H. Helix var. "*rhombea variegata*" Rehd. in Bailey, Cyclo. Amer. Hort. ii, 716 (1900).

H. japonica f. *variegata* Nakai, in Journ. Arn. Arb. v, 26 (1924).

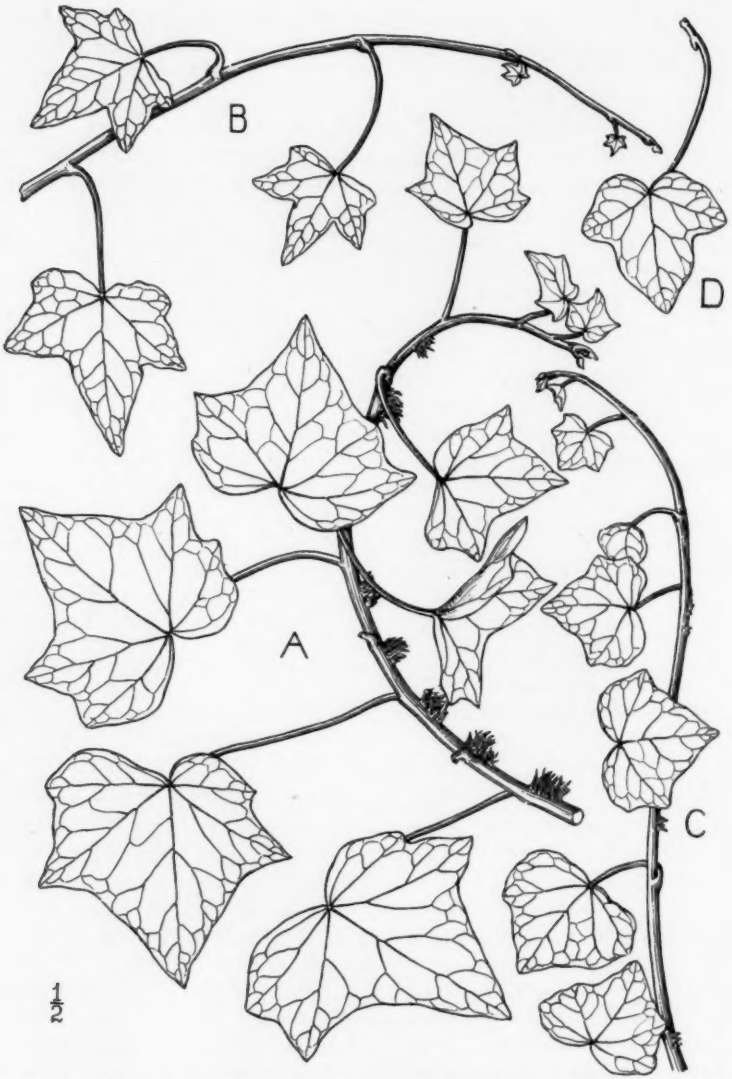
Differs from the typical element only in the narrow marginal variegation of the leaves. Living specimens have been seen in the American trade and numerous collections exist in the herbaria.

V. **Hedera Helix** Linn. Sp. Pl. i, 202 (1753). ENGLISH IVY. Figs. 74, 78–86.

Juvenile and adult stages examined. Twigs dull green to purplish, slender to stout, moderately stellate-hairy; possessing aerial rootlets in most variants of the juvenile stage; hairs with 4–12 stellate rays, grayish, usually small and less conspicuous than in some other species: leaves coriaceous; those of the juvenile stage usually 3–9-lobed or if entire with a strongly cordate to hastate base, usually 2–15 cm. long; apices generally flat but in some clons they are strongly and sometimes stiffly undulate or contorted; venation palmate, the veins usually lighter colored than adjoining areas or becoming almost white; blades normally dark green at maturity but albinism of various degrees and patterns may be encountered: foliage of the adult or arborescent stage much less diversified in size, shape and coloration, being for the most part ovate to elliptic-rhombic; bases cuneate, rounded or truncate; apices generally acute; individuals may exhibit albinism to a limited extent about the leaf margin, but generally the foliage is uniformly olive-green minus the pale or whitened veins characteristic of many juvenile variants: flowers greenish-yellow, on stout pedicels and peduncles, the latter and the calyces densely gray-white-stellate: fruit black or yellowish-orange, usually 5–9 mm. across, maturing in northern regions of United States in November.

The English ivy is a Linnæan species. According to Jackson's Index to the Linnean Herbarium (1912), there is a specimen in the Linnean herbarium and he indicates it to have been there prior to the publication of Species Plantarum (1753). The Linnæan specimen is then the type for the species. Neither the Linnæan specimen nor a photograph of it has been seen by us. On its study depends the critical identity of the plant here tentatively referred to as the typical element. The term typical element (or var. *typica* as it may be written) means that the plant so designated is considered to be the same as, or essentially indistinguishable from, the type specimen on which the species is based.

Some of the more recent American writers on the ivy, having no clear



79. HEDERA HELIX. A, Irish ivy, var. *hibernica;* B, var. *lobato-major;* C, var. *scutifolia;* D, leaf of var. Emerald Gem.

conception as to how a species is typified, have endeavored to learn the identity of the "true" English ivy by such superficial efforts as making inquiry of English-trained gardeners as to their interpretation of the plant's identity or by seeking pseudo-authentic or "certified" specimens of the plant as grown in England's leading botanical gardens under the label name of *Hedera Helix*. It has been admitted that the results of such inquiries were not in agreement and these conclusions have been published with the suggestion that perhaps it is not known just which cultivated variant represents typical English ivy.

There is neither mystery nor uncertainty as to the proper method of determining the type or typical element of any species. The type of a species is the pressed specimen deposited in an herbarium and on which the published description accompanying the binomial representing the species or plant of lesser rank was based. In the case of the English ivy, the typical element consists of those plants which match the specimen known to be in Linnæus' herbarium. The Linnean Herbarium is believed to have been removed temporarily from the British Museum for safe keeping until the present emergency is past. On its return, we will be able to examine the specimen and then know as exactly as possible what is the circumscription of the plant in his Species Plantarum. Meanwhile, we can learn approximately the characteristics of his plant from the descriptions in references cited by Linnæus and in the Swedish floras of the period.

The species, *Hedera Helix*, covers the greatest geographical area of any species in the genus. In general its natural distribution is throughout western Europe from the British Isles north to southern Scandinavia (excepting the Faeroe and Hebrides Islands) to about 60° N. Lat., southwest to Estonia and along the Baltic Sea, through southern Poland southwest to the western shores of the Black Sea and limited along its southern fringe by the Mediterranean and on the west by the Atlantic. It has escaped from cultivation and become extensively naturalized in other parts of the world as, for example, in North Carolina and eastern Virginia in this country. Further, within the general European area outlined above there are numerous localities in which it is wholly unknown.

Without question, the English ivy is the most variable of the genus, particularly in its juvenile stage. It is represented by many named variants and most named individuals in the trade belong here. Only a few are varieties in the botanical sense and these few are geographical variants originating from a particular region in nature and by virtue of their isolation possess morphological characters which are more constant genetically than those of the horticultural clons here given equal nomenclatorial rank. Most of the named variants represent selected individuals that have been propagated vegetatively as distinct clons for a period of many years. The number of these clons is gradually increasing due to the continual introduction of

novelties and intermediate variants. We have seen large specimens of *Hedera Helix* growing without restriction on which could be selected juvenile shoots bearing foliage ascribable to no less than six sorts. Were these to be propagated vegetatively and grown separately, they would correspond to well-established and already named clons: such is the state of flux within the species.

The horticulturist, for the most part, is more concerned with these clons than with the so-called botanical varieties of restricted geographic distribution in nature. Only a few herbarium collections have been seen of wild or native plants that could be referred without question to recognized clons, indicating that the foliage differences characterizing these clons rarely are represented throughout the entire foliage of any single plant in nature. They occur sporadically as shoots of abnormal foliage and do not persist unless isolated and perpetuated asexually. The few specimens from nature considered by us to be referable to recognized clons were probably of this sporadic origin and were collected merely by chance.

Most of these clons are of too transitory a character to be worthy of botanical recognition even of such a minor botanical category as *forma*, but because they are of definite horticultural value and their names are now employed extensively in the horticultural literature, they are here designated as varieties for reasons indicated elsewhere in this paper.

There are about thirty clons of English ivy bearing Latin varietal names. They are known universally in the trade and to ivy enthusiasts by Latin names. This is true to the extent that their Latin names have become common to the user, as are the Latin generic names of Aster, Zinnia and Iris to any flower lover. The current edition of Standardized Plant Names lists a galaxy of English ivy clons and seemingly by whatever Latin names could be found. These names are, in accordance with editorial policy, accompanied by English equivalents that are erroneously considered by the editors to be "common names." Some of the Latin names listed are later homonyms of earlier valid names. Should one be inclined to accept this assignment of English names, it will be awkward indeed to speak of var. *gracilis* as the Miniature ivy whereas in fact the var. *conglomerata* has much smaller leaves; of var. *mimima* as the Small-leaf ivy when leaves of mature specimens may be five inches or more long; or more confusing yet to refer to var. *conglomerata* as the Bunchleaf ivy when the internodes of members of the Ramosa complex are often more condensed. From the results of this study it becomes apparent that var. *palmata* is a synonym of var. *digitata* in which case the Handleaf ivy bows to the Fingerleaf ivy. A number of Latin names in the Standardized Plant Names list long have been relegated to synonymy; still others in good standing in contemporary literature are unaccounted for and the novice has no English names for them.

Aside from the clons that have been known since their introduction by

vernacular or English names, none of these variants has a true common name other than its Latin appellant. The latter is as common as any name can be. It is now nearly twenty years since the first edition of Standardized Plant Names (1923) proposed ten English names by which as many clons of ivy were to be known. It is significant that, to our knowledge, not one American or English catalogue, trade-list, periodical or text has substituted a single English name for the Latin in referring to these plants.

As previously noted, the descriptions in this paper of the ivy clons have been drawn from living plants in the Cornell collection. These are pot plants and it is significant that the size, and sometimes the color of pot subjects grown in the greenhouse are not at all identical with the foliage of the same clon grown outdoors without restriction. For example, leaves of *Hedera Helix* var. *pedata* (Fig. 82-B) on pot-grown plants average about two and one-half inches in length. Leaves of plants propagated from the same clon and grown several years outdoors here at Ithaca, New York, are five or six inches long, of a more leathery texture and with a more conspicuously white venation. In leaf form and outline, however, the two plants are indistinguishable. Similar observations have been made by us with regard to vars. *minima*, *hibernica*, *Glymii*, *lobato-major*, *Meagheri*, *deltoidea* and *helvetica*. It has not been as conspicuous with vars. *erecta*, *conglomerata*, *sagittæfolia* nor typical *Hedera Helix*.

Although this paper concerns itself primarily with the taxonomy of the Hederas, it should be pointed out that too little is known about their resistance to low temperatures, their tolerance of various exposures and adaptability for wall and ground-covers. Research along these lines is being conducted by R. C. Allen of the Department of Floriculture and Ornamental Horticulture at Cornell University. While results for this region are being gathered and eventually will be published, it is highly desirable that similar projects be initiated and carried to completion in other climatic areas and under a variety of exposures. Evidence is already available to indicate that *Hedera canariensis* and its variants is more hardy than generally acknowledged, particularly when grown as a ground-cover. Several members of the Ramosa complex (cf. pages 150–157) may prove to be hardy in protected areas despite the fact that they are more commonly distributed as novelties or pot subjects for the home.

The key that follows makes no attempt to indicate a natural grouping, but the so-called varieties appear in the text in the numerical sequence here indicated at the right.

Key to the varieties of *H. Helix:*

1. Stems without aerial rootlets: plants shrubby: leaves mostly entire, bases generally cuneate.
   2. Fruit black, 5–7 mm. (about ¼ inch) across..... arborescent or adult stage.
   2. Fruit yellowish-orange, 7–9 mm. (about ⅜ inch across).....38. var. *poetica*

1. Stems usually with aerial rootlets, at least at the lower nodes: plants vine-like or shrubby: leaves mostly lobed or if not the bases cordate to hastate, not cuneate.
   3. Leaves green, at least in summer.
      4. Habit stiff, plant dense and shrub-like.
         5. Twigs strongly fasciated; leaves to 7.5 cm. (about 3 inches) long. (Fig. 81-C) .....19. var. ALBANY
         5. Twigs somewhat flattened, but not fasciated; leaves 3.5 cm. (1⅜ inches) long or less.
            6. Tips of leaf-lobes usually rounded, at least most of those on a twig so outlined (Fig. 85-B).....33. var. *conglomerata*
            6. Tips of leaf-lobes mostly acute.
               7. Sinuses very shallow, obtuse; terminal lobe broadest at base; twigs relatively few, stiff; plant upright. (Fig. 85-A).....34. var. *erecta*
               7. Sinuses deep, acute; terminal lobe usually broadest near middle; twigs many, very slender; plant spreading. (Fig. 81-A).....21. var. *Meagheri*

      4. Habit strictly trailing or climbing.
         8. Leaves usually without lateral lobes, basal lobes present or absent.
            9. Base of leaf deeply cordate, the sides of basal lobes often overlapping, upper surface dull, apex usually rounded. (Fig. 86-A).....35. var. *deltoidea*
            9. Base of leaf truncate to cordate, sides of basal lobes not overlapping or the lobes scarcely apparent, apex acute or acuminate.
               10. Surface of young leaves glossy; apices acuminate. .....37. var. *Glymii*
               10. Surface of young leaves dull; apices with convex margins.....8. var. *scutifolia*

         8. Leaves mostly lobed, at least laterally.
            11. Plants with leaves having the terminal lobe approximately the same size as lateral lobes, usually 5-lobed and if 3-lobed see below in second 11.
               12. Leaf wavy or coarsely undulate; lobes often with 1–2 obtuse teeth along margin. (Fig. 84-B)..32. var. *crenata*
               12. Leaf flat or curved, margin not strongly wavy; lobes usually without marginal teeth. (Fig. 84-A) .....30. var. *digitata*

            11. Plants with leaves having terminal lobes distinct and larger than the lateral lobes, or 3-lobed with all or most of lobes approximately equal in size.
               13. Foliage with some of the leaves deeply cleft, the terminal lobe lanceolate and in some leaves deeply and narrowly so, usually 2–4 times as long as wide.

14. Leaves 3–5-lobed, terminal lobe broadest at base, without marginal teeth, in some leaves deltoid, usually dark bronzy-green (veins often whitish); twigs usually brownish-purple. (Fig. 82-A).... 27. var. *minima*

14. Leaves mostly 5-lobed, terminal lobe usually broadest about ¼ of its length above base, frequently with 1–2 marginal teeth, bright green with prominent veins; twigs green and sometimes with purplish areas. (Fig. 82-B)..... 29. var. *pedata*

13. Foliage with terminal lobes of leaves broader than lanceolate throughout the plant, rarely more than twice as long as wide.

15. Base of leaf deeply cordate with sides of lateral lobes usually overlapping, at least on most leaves.

16. Midvein of uppermost lateral lobe forming a right or obtuse angle with leaf midrib; hairs frequently with 8 rays; veins greenish-white. (Fig. 83-B)..... 28. var. *sagittæfolia*

16. Midvein of uppermost lateral lobe usually forming an acute angle with midrib; hairs usually 4–6-rayed; veins whitish and with narrow white zone paralleling them. (Fg. 83-A)..... 36. var. *helvetica*

15. Base of leaf rounded to cordate, lateral lobes not overlapping.

17. Lateral branches produced abundantly and precociously in most of the leaf-axils of stems and twigs.

18. Terminal lobe broadest above the base. (Fig. 81-A). 21. var. *Meagheri*

18. Terminal lobe broadest at base.

19. Leaves 1–3-lobed or entire.

20. Lower side of lateral lobes convex..... 25. var. SYLVANIAN

20. Lower side of lateral lobes concave; apices of lowermost leaves obtuse..... 24. var. MAPLE QUEEN

19. Leaves mostly 5-lobed.

21. Basal lobes never well developed... 24. var. MAPLE QUEEN

21. Basal lobe, when 5-lobed, often angular and prominent.

22. Leaves flat or essentially so..... 15. var. PITTSBURGH
18. var. HAHN SELF BRANCHING

22. Leaves very strongly crisp-undulate or contorted..... 23. var. HOLLY

17. Lateral branches few, plant not at all precocious.

23. Veins conspicuously whitish on upper surface.

24. Leaves small, mostly 2.5 cm. (1 inch) long or less. (Fig. 78-C)..... 3. var. *walthamensis*

24. Leaves more than 3 cm. (1¼ inches) long.

25. Hairs with predominately 8 rays..... 2. var. *baltica*

25. Hairs with predominately 4–6 rays.

26. Young leaves light greenish-yellow; mature leaves dark green..... 22. var. RUSSELL GOLD

26. Young leaves green or soon becoming so.

27. Most leaves predominately and conspicuously 5-lobed, their bases usually deeply cordate..... 1. var. *typica*

27. Most leaves predominately 3- or weakly 5-lobed, their bases often truncate or shallowly cordate.

28. Sinuses shallow and obtuse or nearly absent between terminal and lateral lobes; sides of terminal lobe usually convex..... 8. var. *scutifolia*

28. Sinuses deep, usually acute; sides of terminal lobe usually straight or concave, often finely undulate. ..... 26. var. *triloba*

23. Veins green on upper surface.

29. Leaves large, predominately 8–14 cm. (3–5½ inches) wide.

30. Blades light green, often tinged reddish; terminal lobe much longer than broad, the sides slightly convex, straight or sometimes concave.....15. var. PITTSBURGH
18. var. HAHN SELF BRANCHING

30. Blades dark green; terminal lobe as broad as long or nearly so, the sides usually convexly curved.
31. Sinuses very shallow, wide. (Fig. 79-A).....4. var. *hibernica*
31. Sinuses deep, narrowly acute. (Fig. 79-B).....6. var. *lobato-major*

29. Leaves small, predominately 5–8 cm. (2–3 inches) wide.
32. Hairs often with 8 rays (at least 20 per cent so).
33. Twigs brownish-purple: leaves thin, with purplish cast...14. var. *gracilis*
33. Twigs green except on sunny side: leaves thick, not purplish but usually dark green.....2. var. *baltica*

32. Hairs with rarely more than 6 rays.
34. Young leaves light greenish-yellow.....22. var. RUSSELL GOLD
34. Young leaves green.
35. Mature leaves of 2–3-year-old stems with terminal lobe margins concave or occasionally convex; veins to basal lobes conspicuous.....1. var. *typica*
35. Mature leaves of 2–3-year-old stems with terminal lobe margins almost always strongly convex; veins to basal lobes often reduced or wanting.
36. Terminal lobe of most leaves not longer than wide, basal and lateral lobes usually separate and distinct. (Fig. 79-D).....7. var. EMERALD GEM
36. Terminal lobe of many leaves slightly longer than wide, basal and lateral lobes often united without intervening sinus. (Fig. 79-C).....8. var. *scutifolia*

3. Leaves variegated with white or yellow markings (sometimes the surface is merely flecked with variegation) or uniformly yellow throughout.
37. Variegation of leaves confined to marginal areas.
38. Plants precocious, short shoots commonly produced in most leaf-axils of twigs and stems.....10. var. LEE SILVER
38. Plants not precocious, short shoots not produced in leaf-axils of twigs and only occasionally in stems.
39. Foliage variegation constant in all seasons.....9. var. *Cavendishii*
39. Foliage with leaf edges becoming red in autumn, especially when grown outdoors, petioles reddish.....11. var. *tricolor*

37. Variegation of leaves central, or distributed irregularly over the surface, not forming a marginal band or zone.
40. Leaf surface spotted or streaked white or cream-color.
41. Leaves large, frequently 10 cm. (4 inches) wide; terminal lobe as broad as long. (Fig. 80-C).....5. var. *maculata*
41. Leaves small, seldom more than 5 cm. (2 inches) wide; terminal lobe somewhat longer than broad (Fig. 80-A)....12. var. *discolor*

40. Leaf surface with one or a few patches of variegation, not profusely spotted nor striped.
42. Leaves with yellowish-green area bordering midrib, margins green.
43. Petioles 5–20 mm. (¼–¾ inch) long, internodes of axillary shoots 2–6 mm. (to ¼ inch) long.....
.....20. var. MERION BEAUTY
43. Petioles mostly 2.5 cm. (1 inch) long or more, internodes of axillary shoots mostly 1.5-2.5 (½-1 inch) long .....
.....17. var. GREEN QUARTZ

42. Leaves not zoned as above.
44. Terminal lobe larger than lateral lobes.13. var. *aureo-variegata*
44. Terminal lobe about same size as lateral lobes.....
.....31. var. *palmato-aurea*

1. **H. Helix** typical element. Figs. 74, 78-A, 78-B.

H. Helix Linn. Sp. Pl. i, 202 (1753).

H. communis S. F. Gray, Nat. Arr. Brit. Pl. ii, 491 (1821).

H. communis β sterilis S. F. Gray, l.c.

H. Helix α vulgaris DC. Prod. iv, 261 (1830).

H. Helix arborescens Lodd. ex Loud., Arb. et Frut. Brit. ii, 1000 (1838).

H. Helix subvar. *prostrata* Cosson & Germain, Fl. Envir. Paris, Ed. 2, 279 (1861).

H. Helix α melanocarpa Seemann, in Journ. Bot. ii, 306 (1864).

H. Helix leucocarpa Hibb., The Ivy, 92 (1872).

H. Helix latifolia Hibb. l.c.

H. arborea Carr. in Rev. Hort. lxii, 164 (1890), non Swartz, 1797.

H. arborea intermedia Carr. l.c.

H. arborea microphylla Carr. l.c.

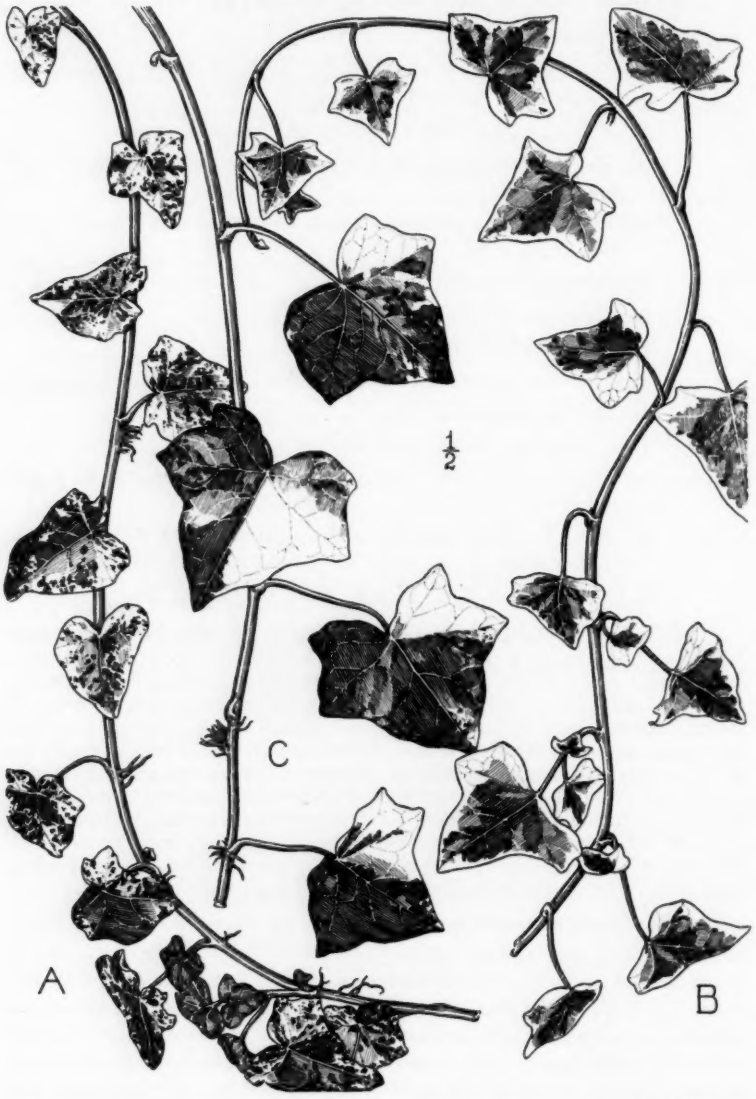
H. Helix var. *europea* Voss, in Vilmorin, Blumengärtneri, i, 407 (1896).

H. Helix f. *arborea* Schelle, in Beissner, Schelle & Zabel, Handb. Laubh.-Ben. 363 (1903).

H. Helix ssp. *eu-Helix* Hayek, Prod. Fl. Balcan. i, 955 (1927).

This is here tentatively characterized as a climbing or trailing vine (arborescent in adult stage), having clusters of short aerial rootlets produced from nodes of the scandent twigs: twigs and petiole bases usually dull brownish-red or purplish and covered abundantly with 4–6-rayed stellate hairs: leaves of juvenile stage coriaceous, mostly 2.5–5.0 cm. long and about as wide, mostly 5-lobed, sometimes the basal lobes greatly reduced in size and seemingly absent, terminal lobe largest and essentially equilateral or at least rarely much longer than wide, upper surface dull dark green with raised whitish midrib and veins; margins entire or irregularly and remotely undulate: leaves of adult stage unlobed, bases truncate to cuneate or less frequently shallowly cordate in some forms as observed in both cultivated and wild material, apices acute, margins undulate.

About a dozen named varieties or clons of ivy appear to be more closely associated with the typical element than with other variants of *H. Helix*. Some of them, as *baltica*, *gracilis* and *walthamensis*, are normal green-leaved sorts, others including Hahn Self Branching and Green Quartz are of the precocious or Ramosa class having axillary shoots produced in abundance, while still a third group differs primarily in having variegated leaves of one sort or another. A second group of clons, distinct in their extremes, but definitely integrating with this typical complex, is characterized by the uniformly lobed leaves in which the terminal lobe is not longer nor larger



80. HEDERA HELIX. Juvenile foliage of A, var. *discolor;* B, var. *Cavendishii;* C, var. *maculata.*

than the laterals and is illustrated by the vars. *digitata* and *crenata*. Intermediates between all the above-named clons exist, and occasionally they may not be identified with any known clon: unless of distinct horticultural merit over named clons, they should not be perpetuated.

The typical element is readily characterized by its dark leathery five-lobed and small leaves, their conspicuous whitish venation and 4–6-rayed stellate hairs. Any plant uniformly showing major modifications from the description above cannot be considered as representing our concept of typical *Hedera Helix*.

2. **H. Helix** var. **baltica** Rehd. in Bailey, Stand. Cyclo. Hort., iii, 1438 (1915); E. Anderson, in Arnold Arb. Bull. vi, i (1932). BALTIC IVY.

In his original description, Rehder stated "a small-leaved form, hardly differing from the type; the hardiest or one of the hardiest forms in cultivation." Professor Rehder considers the plant growing on the south wall of the Administration building at the Arnold Arboretum as typical of this variety.

An effort is here made to keep this variant distinct from typical *H. Helix* but it must be pointed out that the differences are scarcely discernible morphologically and that the character employed in our key, i.e. hairs 4–6-rayed in *typica* and often 8-rayed in *baltica*, is at best weak and by no means conclusive. It was arrived at from a study of hairs on a large number of specimens and perhaps indicates a trend rather than a constant character. It would be better if this were treated as a strain of typical *H. Helix*, differing primarily in its greater resistance to severe winter conditions. We find no constant difference in the leaf size of the two.

A good account of this plant is given by Edgar Anderson (l.c.) and from whom we learn that it was discovered by Alfred Rehder near Riga, Latvia, where it was growing as a ground-cover in pine woods and that the first living material of it to reach this country arrived at the Arnold Arboretum in 1907.

3. **H. Helix** var. **walthamensis** Paul, in Gard. Chron., 1867, p. 1215. Fig. 78-C.

Twigs and petiole bases light reddish-brown or greenish, stellate-hairy: leaves 3–5-lobed, mostly 1.5–3.0 cm. long and rarely to 4 cm. long, about as wide as long with the terminal lobe about as wide as long; sinuses mostly acute, lobes rounded or sharp-pointed, veins raised and whitish.

This is the smallest-leaved variant in the so-called typica-complex. The foliage in texture, outline, color and venation closely resembles that of typical *H. Helix* although in some specimens the green coloration may be definitely lighter and the lobes more rounded. It is not at all common in

ivy collections and is not known to be offered under this name to the American trade by foreign or domestic plantsmen. There is a specimen at the Arnold Arboretum sent by Nicholson from the Kew collection but, significantly, Nicholson did not account for the plant nor mention the name in his Dictionary. Although Tobler accounted for the name in 1927, he admittedly did not know the plant and our last real record of it is in the Kew Handbook of 1902, indicating it to have been growing then at Kew. A good living specimen in the Cornell collection is from an unknown source.

4. **H. Helix** var. **hibernica** (Kirchn.) Jaeger, Ziergh. 250 (1865). IRISH IVY. Fig. 79-A.

H. Helix 4. *hibernica* Hort. ex Kirchn., in Petzold & Kirchn. Arb. Muscar., 419 (1864).

H. canariensis Hibb. in Fl. World, vii, 57 (1864), non Willd.

H. Hibernica vel *Scotica* Seemann, in Journ. Bot. iii, 201 (1865) and Rev. Nat. Ord. Heder., 65 (1868), *pro syn.*

H. grandifolia Hibb., The Ivy, 96 (1872), *pro parte.*

H. Helix hibernica Dippel, Handb. Laubholzkunde, 246 (1893).

H. hibernica Carr. in Rev. Hort. lxii, 163 (1890), *nomen subnudum;* Bean, Trees & Shrubs Brit. Isl. i, 609 (1914).

H. Helix var. *europea* Voss f. *melanocarpa* Voss, in Vilmorin Blumengärtneri, i, 407 (1896).

H. scotica A. Chevalier, in Monde Pl. xxxiv, 42 (1933).

Twigs greenish-brown and suffused burgundy-red toward tips, densely gray-canescent-stellate, the twig hairs mostly 6–8-rayed, those of leaves on both surfaces and often only 4-rayed; internodes 3–5 cm. long: leaves 5-lobed, mostly 5–12 cm. long or on young vigorous shoots to 15 cm. long, dull dark green, veins lighter but distinctly green except rarely when several years old; terminal lobe largest and generally as wide as long, its sides usually convexly curved; apices acute, base deeply cordate; petioles mostly 5–20 cm. long, green or slightly reddish at base.

The nativity of this plant is in doubt. Seemann (1865) states definitely that it is native in Ireland. Sir J. D. Hooker in the sixth edition of his British Flora (1892) says "it is a very doubtful native of Ireland." Twenty years later Tobler stated (translation ours) "The occurrence in the wild for this variety is established with certainty only in Ireland, similar reports with regard to Scotland are unreliable." That it is well established in Ireland is without question and according to Mackay, who wrote in his Flora Hibernica in 1836, "a variety called the Irish ivy (of which I have specimens collected by Mr. W. Andrews on the rocks at Ballybunian, county of Kerry) is much cultivated on account of its very large leaves and quick growth."

Much of the ivy grown as a wall and ground-cover, at least in the eastern part of this country, is var. *hibernica*. It is offered to the trade under this name by only seven domestic dealers while three others list it as *Hedera hibernica*, following Bean's evaluation of the plant. Of the 152 American dealers offering typical *H. Helix*, one may well anticipate the stock of a considerable number to be Irish ivy. This is evidenced not only by the great abundance of var. *hibernica* in cultivation but also by the fact that in an examination of nursery stocks of the first twelve plants labelled *H. Helix*, nine were this variety and the others either the typical element or var. *baltica*.

The Irish ivy is probably not a clon, but rather a geographical variety having inheritable morphological characters distinct to itself. It is not easily confused with typical *Hedera Helix* and from it distinguished by its larger, more dense and vigorous growing foliage whose leaves are from 2–5 inches long and have their veins distinctly green although lighter than the ground work of the blade. In typical *H. Helix* the leaves of the older stems have a characteristic grayish-white venation and the blades are rarely more than 2½ inches long. This distinction is not as conspicuous in the young leaves of growing twigs of typical *H. Helix* because then the ground work of the blade is a brighter and lighter green.

5. **H. Helix** var. **maculata** (Hibb.) Rehd. in Bailey, Cyclo. Amer. Hort. 716 (1900). Fig. 80-C.

H. grandifolia maculata Hibb., The Ivy, 98 (1872).

H. latifolia maculata Hibb. l.c., *pro syn.*

H. canariensis Hibb. var. *maculata* Hibb. in Journ. Roy. Hort. Soc. xii, 394 (1890).

H. Helix f. *maculata* Tobler, Gatt. Hedera, 139 (1912).

H. hibernica var. *maculata* Bean, Trees & Shrubs Brit. Isl., i, 609 (1914).

H. latimaculata Hort. ex Bean, l.c., *pro syn.*

Differs from *H. Helix* var. *hibernica* primarily in leaves spotted and streaked white or cream-colored but the variegation not forming a marginal band. Not known to be commonly cultivated nor is it known to be offered by nurserymen. Representative plants of it are in the Cornell collection.

† 6. **H. Helix** var. **lobato-major** Lawr. var. nov. Fig. 79-B.

H. Helix lobata major Hibb., The Ivy, 67 (1872).

A valde affini *H. Helix* var. *hibernica* differt folii lobis terminalibus longis quam latis, sinubus angustioribus sæpe acutis.

This clon, long known in the literature and trade by Hibberd's illegiti-

mate quadrinomial, resembles var. *hibernica* in its rather large leaves having pale green veins and fine prominent lobes. As delineated in the key, it is distinguished from the Irish ivy only by its conspicuously elongated terminal lobe and the deeper, more acute and narrower sinuses particularly those between terminal and lateral lobes. It is not a distinctive clon and scarcely worthy of nomenclatorial recognition, but we have been reluctant to merge it with the Irish ivy where otherwise it would be placed.

7. **H. Helix** var. EMERALD GEM. Fig. 79-D.

A vernacular-named variant whose leaf outline is very close to var. *scutifolia* (below) and not too unlike that of the typical *H. Helix*. From the former it is distinguished with difficulty and its only claim to distinction is that in general the terminal lobes are shorter than wide or only as long as wide and their sides are strongly convex. The basal lobes are always present and usually the venation is inconspicuous except for primary veins. First described by Carrière in The Garden (xxxiv, 493, 1888) and frequently erroneously labelled Emerald Green.

† 8. **H. Helix** var. **scutifolia** (Hibb.) Lawr. stat. nov. Fig. 79-C.

H. Helix scutifolia Hibb., The Ivy, 71 (1872).

H. Helix lucida Hibb. op. cit., 68.

H. Helix spectabilis aurea Hort. Auth., *pro parte*.

Twigs and petioles green to purplish-red or only flecked purple-red: leaves ovate, mostly 3-lobed, or if 5-lobed the basal lobes of most leaves not prominent, bright dark green with paler green veins; terminal lobe as long as broad or longer and usually, but not always, separated from lateral lobes by a broad shallow obtuse sinus, its sides usually convex and often strongly so; lateral and basal lobes frequently not separated by a sinus or the latter, when present, very shallow and broad; bases cordate, apices acute; margins entire, flat or occasionally undulate.

Typically, the leaves of this clon are 3-lobed and strongly cordate at the base. On most plants, some 5-lobed leaves will be noted. However, it would seem from study of a large number of individuals (about fifty plants in the Cornell collection from half as many sources) that this variant represents a common entity toward which many other clons show distinct trends of variation. It is close to typical *H. Helix* in the 5-lobed character of some leaves, to Emerald Gem in its strongly convex terminal lobe and usually 3-lobed leaf, to var. *minima* in having some leaves possessing long terminal lobes and the occasional purple-red twigs, to var. *triloba* from which it differs in the strongly cordate leaf-bases and brighter green leaves, and to var. *hibernica* in the coloration and outline of many leaves and differing primarily from it in the smaller leaf size. In other words, the occasional presence of characters normally associated with these closely related vari-

ants appears to come within the range of variational limits of var. *scutifolia* although not characteristic of it in its most typical form.

Although much material has been received as var. *lucida* (one collection indirectly from Kew) none of it matches Hibberd's description insofar as the very glossy leaf surface is concerned except for an occasional two or three leaves at the tips of some twigs. In other respects the plants come within our concept of var. *scutifolia*.

9. **H. Helix** var. **Cavendishii** Paul, in Gard. Chron., 1867, p. 1215; emend. Lawr. Fig. 80-B.

H. arborea variegata Hibb. in Fl. World, i, 138 (1858).

H. Helix arborescens alba lutescens Hibb. op. cit. vii, 59 (1864).

H. Helix arborescens marginata argentea Hibb. l.c.

H. Helix marginata elegantissima Hibb. l.c.

H. Helix marginata elegans Hibb. l.c.

H. Helix marginata canescens Hibb. op. cit., 71.

H. Helix var. *Cavendishii* Paul, in Gard. Chron., 1867, p. 1215.

H. Helix arborescens albo-lutea Paul, l.c.

H. Helix marginata Hibb., The Ivy, 77 (1872).

H. Helix marginata minor Hibb. op. cit., 78.

H. Helix marginata grandis Hibb. l.c.

H. Helix marginata lactea Hibb. op. cit., 79.

H. Helix argentea major Hibb. op. cit., 93.

H. Helix argentea minor Hibb. l.c.

H. Helix variegata Nichols., Ill. Dict. Gard. ii, 122 (1882).

H. Helix f. *Cavendishii* Tobler, in Mitt. Deutsch. Dendr. Ges., 1927, p. 21, t 10 d.

Twigs and petioles greenish: leaves usually 1.7–4.0 cm. long, deltoid to 5-lobed with the terminal lobe generally equilateral, bases cordate, upper and lower sides usually conspicuously stellate-hairy, midrib raised and generally so throughout its length; leaf margin white or ivory variegated, usually narrowly so.

Nearly a score of names have been applied to this plant, although admittedly our interpretation of its limits are broader than those of earlier ivy students. The bulk of contemporary literature treats the plant as *H. Helix marginata* but this is not the oldest name and hence may not be used.

The first name found for this plant is Hibberd's trinomial of *H. arborea variegata* but we may not use that name for neither Hibberd nor anyone else ever published a description of *Hedera arborea* for the adult stage of *H. Helix* although the binomial was applied by Olaf Swartz in 1797 to a

plant of a related genus (now known to be *Dendropanax arboreum*) and still earlier by Thomas Walter in 1788 to a species of grape.

William Paul in 1867 recognized twelve sorts of variegated English ivies. Eleven of the names were quadrinomials and may not here receive further consideration, although all except one were clons of marginal variegation differing in extent and shade of variegation as well as size of leaf. His twelfth and last described variegated element he called *H. H. Cavendishii*. Because he titled his enumeration: "HEDERA HELIX (European Ivy). *Group I. Climbing varieties*" we may validly write the name *Hedera Helix* var. *Cavendishii* Paul. This is the oldest legitimate varietal name found for the plant.

Hibberd did not make the combination of *H. Helix marginata* until 1872 and the publication of his several quadrinomials in 1864, representing minute variants of the marginata complex, is illegitimate.

Tobler (1927) referred most of the marginata quadrinomials of Paul and Hibberd to *H. Helix* var. *hibernica*. Rehder (1940) has recognized Hibberd's *marginata* but does not account for Paul's var. *Cavendishii* although he did so in Bailey's Standard Cyclopedia of Horticulture (1915), where he kept the two entities separate.

As indicated by the above synonymy and description, we have interpreted Paul's var. *Cavendishii* in a broader sense than he originally applied it. It now embraces all of the small-leaved marginally and uniformly variegated clons of *Hedera Helix*, irrespective of leaf shape or of shade and width of variegation. This seems to be the only disposition compatible with the extreme instability of the clons here united and the name *Cavendishii*, being the oldest in this category, must be adopted for the group.

10. **H. Helix** var. LEE SILVER.

A variegated-leaved member of the Ramosa complex characterized by its precocious habit of growth, accompanied by the production of many shoots in the axils of the twig and stem-leaves and by its obtusely three- or more rarely five-lobed deltoid leaves. Distinguished from var. *Cavendishii* in having an irregular margin of cream-colored variegation with the central portion of the plant comprised of a gray-green two-toned mottling; midrib and veins usually cream-colored.

In general the leaves of this clon are usually 1 to 1½ inches long, having slightly wider margins, acute apices and shallowly or broadly cordate bases. It is less vigorous than other members of the Ramosa complex.

11. **H. Helix** var. **tricolor** Rehd. in Bailey, Stand. Cyclo. Hort., 1438 (1915).

H. Helix marginata Cullisii Hibb. in Fl. World, vii, 71 (1864).

H. Helix marginata pulchella Hibb. l.c.

H. Helix marginata major Hibb. l.c.

H. Helix Cullisii Haage & Schmidt, Trade Catalogue (1869) apud Tobler, Gatt. Hedera, 127 (1912), *nomen subnudum.*

H. Helix marginata rubra Hibb., The Ivy, 79 (1872).

H. Helix tricolor Hibb. op. cit., 78, 79, *in syn.*

H. Helix elegantissima Hibb. op. cit., 78.

H. tricolor Nichols., Ill. Dict. Gard. ii, 123 (1885), *nomen nudum* in syn.

H. Helix f. *Cullisii* Tobler, in Mitt. Deutsch. Dendr. Ges., 1927, p. 22.

Differs from var. *Cavendishii* in its leaf edges becoming reddish in autumn, a character usually dependent on external conditions: petioles usually purplish at all seasons.

Previously the name of this variety has been credited to Hibberd as of 1872. Hibberd never made a var. *tricolor*, in fact it is doubtful whether he knew what tricolor was, for in his book The Ivy he treated it as a synonym of *H. Helix marginata rubra* and *H. Helix marginata grandis*. The Rules of Nomenclature preclude the acceptance as valid names of those published as synonyms. Hibberd tells us in his papers that the names he placed in synonymy are label names under which he received living material. Such names are not even synonyms in the botanical sense for their disposition by Hibberd was not based on the literature nor on any older authority.

† 12. **H. Helix** var. **discolor** (Hibb.) Lawr. stat. nov. Fig. 80-A.

H. Helix var. *minor marmorata* Paul, in Gard. Chron., 1867, p. 1215.

H. Helix dealbata Hibb., The Ivy, 81 (1872).

H. Helix discolor Hibb. op. cit., 82.

H. Helix marmorata Nichols., Ill. Dict. Gard. ii, 921 (1885).

?*H. Helix* var. RICHMOND GEM Hort.

H. Helix f. *discolor* Tobler, in Mitt. Deutsch. Dendr. Ges., 1927, p. 23.

H. Helix f. *marmorata* Tobler, op. cit., p. 29, excl. syn.

A small-leaved clon much resembling the typical element in general appearance, size and texture except that some of the leaves are flecked or minutely dotted with white or yellow variegation and frequently these minute areas of variegation converge and assume proportions equivalent to blotches.

Not all leaves of a plant need be variegated to be placed here. We have felt that any plant producing leaves of this type of variegation and belonging to the *H. Helix* complex should be classified as var. *discolor*. In a few

plants of the Cornell collection most of the leaves on each were variegated, although in most instances they were not variegated but were dark green with grayish-white raised veins.

13. **H. Helix** var. **aureo-variegata** Weston, in The Univ. Bot. & Nurseryman, i, 123 (1770).

H. Helix foliis aureis Loud., Arb. et Frut. Brit. ii, 1000 (1838).

H. Helix aurea densa Hibb. in Fl. World, vii, 71 (1884).

H. Helix aurea densa minor Hibb. l.c.

H. Helix aurea maculata Hibb. l.c.

H. Helix aruntiaca Hibb. l.c.

H. Helix arborescens aurea maculata Hibb. op. cit., 59.

H. Helix arborescens aureum Hibb. l.c.

H. Helix arborescens minor lutea Hibb. l.c.

H. Helix marginata latifolia Hibb. op. cit., 72.

H. Helix marginata robusta Hibb. l.c.

H. Helix arborescens foliis aureis Paul, in Gard. Chron., 1867, p. 1215.

H. Helix aurea Hibb., The Ivy, 96 (1872).

H. Helix chrysophylla Hibb. op. cit., 85.

H. Helix luteola Hibb. op. cit., 93.

H. Helix marginata aurea Hibb. op. cit., 82.

H. Helix sub-lutea Hibb. op. cit., 93.

H. Helix succinata Hibb. op. cit., 86.

H. Helix sulphurea Hibb. op. cit., 83.

H. Helix aureola Hibb. in Journ. Roy. Hort. Soc. xii, 393 (1890).

H. Hibernica aureo-marginata Carr. in Rev. Hort. lxii, 163 (1890).

H. Hibernica marginata Carr. l.c.

H. Helix var. *tessellata* Hort. in The Gard. xliv, 150 (1893); Nichols., Ill. Dict. Gard. Suppl., 416 (1901).

?*H. Helix* var. *aurea marginata* Dick, in Flor. Exch. xxxi, 318 (1911).

Plant with leaves variegated yellow, the variegations strictly marginal or comprised of striations or blotches or yellow areas occupying the leaf-blade in part or in whole.

The yellow coloration characteristic of this variant may be from a deep cream-color to butter-yellow and we have been unable to make nomenclatorial segregations on the basis of type or extent of variegation.

By some authors, Weston's name of var. *aureo-variegata* has not been accepted for this entity on the grounds that it was a *nomen subnudum*. Weston (1770, l.c.) in describing the variant merely said, "fol. ex aureo variegatis, 3. aureo-varieg. Gold-striped Ivy." Inasmuch as we consider all yellow-variegated clons (excepting vars. *aureo-palmata* and Russell Gold) to be a single entity, we need no more detailed description than that provided by Weston. If, on the other hand, this entity were to be divided into several named variants, then there would be real difficulty in knowing what Weston had.

14. **H. Helix** var. **gracilis** (Hibb.) Rehd. in Bailey, Cyclo. Amer. Hort., 716 (1900). Fig. 78-D.

H. Helix gracilis Hibb. in Fl. World, vii, 58 (1864), and The Ivy, 67 (1872).

Stems and twigs slender and flexuous, dull burgundy-red, the twigs conspicuously gray-stellate-hairy on young growth; aerial rootlets common at the nodes: petioles 2–5 cm. long, reddish, at least basally: leaves 3–5-lobed, thinly coriaceous, mostly 2.0–4.5 cm. long; terminal lobe largest; margins finely undulate; apices obtuse to bluntly acute; bases broadly and shallowly cordate; stellate hairs often 8-rayed; veins grayish-white, the large one raised.

A not uncommon ivy of spindly growth, characterized by its pale reddish twigs and petioles, rather long internodes (3–4 cm.), and the small dull dark to yellowish-green thinnish leaves.

15. **H. Helix** var. PITTSBURGH.

Of compact dense habit due to the short internodes and precocious branching; twigs greenish to purplish, internodes 1.0–2.0 cm. long, lateral axillary shoots abundantly produced, especially along the basal half of the twigs with these primary laterals again branching in many instances: leaves 3.0–4.0 cm. long, mostly 5-lobed although in many instances the lateral lobes much larger than the basal lobes and the leaf then seemingly 3-lobed, terminal lobe longer than broad or usually so, apices acute; occasional leaves may be unlobed; the leaves lighter green than typical *H. Helix* and the venation less pronounced and green.

With this plant one is introduced to a group of vernacular-named variants characterized primarily by the precociousness of their branching, inasmuch as lateral shoots appear in most of the leaf-axils of the twigs. They belong to the typical Helix complex as is indicated by the general similarity of foliage in many of the clons. Bates has suggested that they be referred to collectively as representing the "ramosa complex." This name, indicative of their much-branched habit, is good but its adoption for the group does not preclude their association and amalgamation with other disjunctive complexes. Because most of the existing members of the Ramosa group are closely allied to the typical *Helix* or var. *hibernica* group,

the distinctions between clons are slight, inconstant and, as new variants are introduced, increasingly fugacious.

These variants are bud sports and are highly unstable, even when treated as clons. Bates described and named fourteen sorts and a half dozen others are in the trade. We have been unable to make a key that would separate one clon from another and have accounted only for the more distinct ones in this treatment. Some of them have been patented, one (var. *Meagheri*) has been given a Latin name, and it is suspected that many are not sufficiently distinct from older sports to be worthy of perpetuation. Without doubt the commercial value of the publicity accompanying the introduction of a new clon is partly responsible for the increasing number of names. It is obvious that such names may be relatively short-lived.

It appears that *Hedera Helix* var. Pittsburgh is the first of the Ramosa sports to be named and distributed. A description of the clon is provided by Bates (Nat. Hort. Mag. ix, 208; xx, 14), from whom we learn that "sometime prior to 1927 this ivy was introduced by Mr. P. S. Randolph of Verona, Pa." Free (1941) gives a more definite date to its origin, and we quote "according to Mr. Paul S. Randolph, it originated about 1915–20 . . . as a sport of the Large Leaf Old English Ivy." As Free notes, this latter was probably *H. Helix* var. *hibernica* although to us the foliage of Pittsburgh is more suggestive in its texture, outline and color of the var. *gracilis*. Inasmuch as several of these vernacularly named clons are bud sports of this variant, we have described it in some detail and propose briefly to contrast some of the others with it. Our information as to much of their history is taken directly from Bates' summary cited above.

There is a variegated sport of this introduced by R. Manda in 1938 that Bates has named Pittsburgh Variegated; we have not seen a specimen of it.

16. **H. Helix** var. LONG POINT.

Originated by the nurseries of W. A. Manda Inc. and named by Bates, this clon is very close to Pittsburgh, from which it is reported to have sported, differing primarily in its leaves mostly 3-lobed with a subtruncate base and an elongated terminal lobe. The plants in the Cornell collection have fewer axillary shoots on the twigs and in several instances so much reduced that the plants could scarcely be considered members of the Ramosa complex.

17. **H. Helix** var. GREEN QUARTZ. Fig. 81-B.

This is a sport of Manda's var. Pittsburgh Variegated, differing in its partial reversion to var. Pittsburgh as indicated by its leaves variegated with lighter green zones paralleling the midrib and lateral veins; in plants grown in full sun, this variegation approaches greenish-yellow with the

venation itself a clearer yellow. In some of the plants of the Cornell collection grown in shade the variegation was scarcely discernible and only the veins exhibit a yellowish color. In most plants the midrib and primary lateral veins are conspicuously raised, at least basally.

18. **H. Helix** var. HAHN SELF BRANCHING.

This variant was reported by Sylvan Hahn of Millville, Pennsylvania, to be a bud sport of Pittsburgh first segregated in 1927 and introduced to the trade in 1932. It is said to differ from Pittsburgh in its more abundant lateral branches, slightly longer internodes, and leaves 5–6.5 cm. long. It appears from the material now on the market that through successive propagations from Hahn's material many of the original slight distinctions have become lost and that the most significant difference between the two is now to be found in their names.

19. **H. Helix** var. ALBANY. Fig. 81-C.

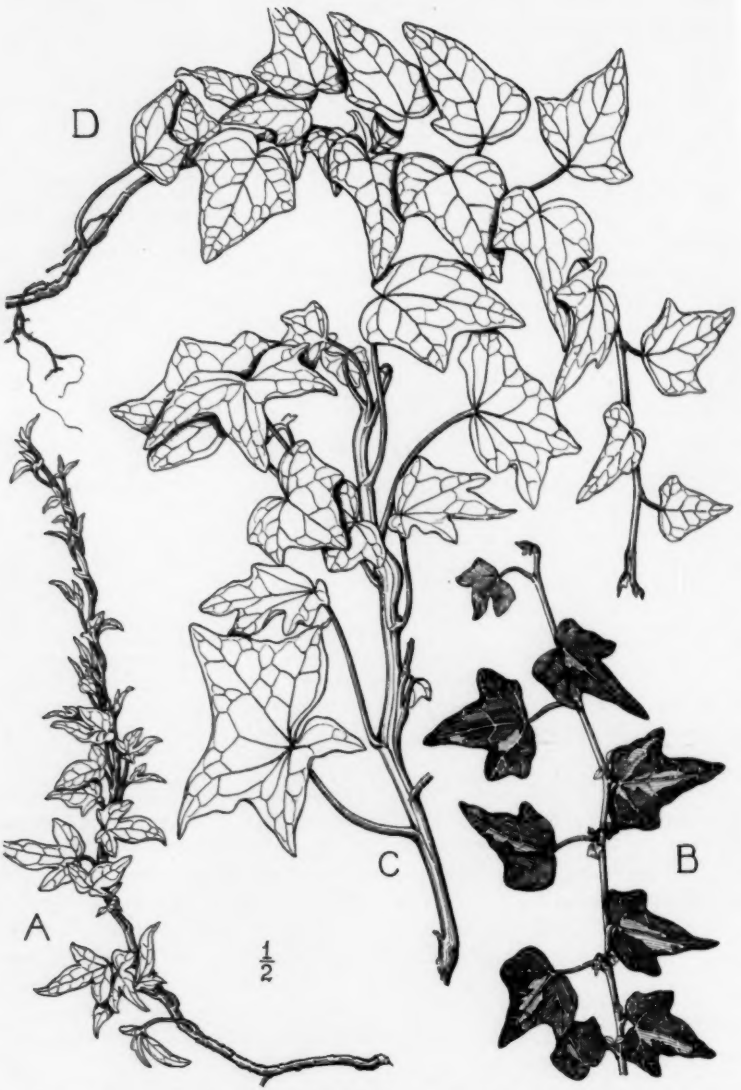
A stout-stemmed shrubby plant with non-flexuous twigs not at all scandent and with few or no aerial rootlets; twigs greenish to reddish-purple, sparsely stellate-hairy except at tips, usually fasciated or some of them so (Fig. 81): leaves 5-lobed or rarely isolated leaves 3-lobed, mostly 2.0–7.5 cm. long and predominately wider than long, thinly coriaceous, veins raised and lighter green than surrounding tissues; terminal lobe usually larger than laterals; bases shallowly to deeply cordate and when the latter the basal lobes often overlap; apices acute: petioles mostly 5–10 cm. long on mature leaves or shorter toward twig ends; internodal length varying from 2–25 mm.

Introduced about 1935 by Fred Danker, well-known Albany, New York, florist and plantsman. It has been distributed subsequently by some dealers as var. *Dankeri*, but the name must be treated as a later and illegitimate synonym.

This is one of the more distinct members of the Ramosa group and bears a stronger resemblance in leaf color, shape and size to *H. Helix* var. *hibernica* than to the typical element. It is readily recognized by its erect shrubby habit, which in our largest plant is a specimen nearly two feet in height, its fasciated twigs and the long stout petioles. Some plants of Albany in the Cornell collection have produced non-fasciated elongated twigs looking much like and indicating a reversion to var. *hibernica*.

20. **H. Helix** var. MERION BEAUTY.

Dense compact plant with long branches of willowy foliage: stems and twigs greenish to pale reddish-purple, sparsely stellate-hairy; internode length variable, on most twigs consistently 2–6 mm. while on others it may exceed 2.5 cm.: leaves basically 5-lobed but in some small individuals basal lobes so greatly reduced that the leaf appears as if 3-lobed; blades 6–25 mm. long, those of axillary shoots generally smaller than of twigs



81. HEDERA HELIX. A, var. *Meagheri;* B, var. Green Quartz; C. var. Albany; D, var. Sylvanian.

and older stems, green often marbled with lighter shades along midrib and lateral veins as in Green Quartz when grown in full sun, otherwise not variegated; veins slightly raised, light green or tinged basally with red.

According to Bates this clon was isolated by Henry Faust of Merion, Pennsylvania. Our correspondence with William I. Thomas of the Faust firm revealed further that "Merion Beauty . . . is a sport of Pittsburgh Self Branching Ivy. . . . It was originally introduced to the trade in general by us during the Florists Delivery Telegraph Convention in Philadelphia, held in September 1937 or 1938. . . . We have since found it to be very unsatisfactory, due to the ease of infestation by red spider and thrips. . ."

Bates figures the leaves of this plant as being 3-lobed or entire (Nat. Hort. Mag. xix 217), a condition not prominent in plants of the Cornell collection nor apparent in the photograph reproduced on page 206 of the Bates' article. The coloration of twigs, petioles and leaves suggests that of *H. Helix* var. *gracilis* although the leaves are of thicker texture. Plants received as Hahn Miniature belong here.

† 21. **H. Helix** var. **Meagheri** Schulze, var. nov. Fig. 81-A.

H. Helix Green Feather cf. Bates, in Nat. Hort. Mag. xix, 212 (1940).

Caule valde et præcoci ramosi, internodi sæpe brevi: foliis trilobis vel quinquelobis, circa 2.0–3.0 cm. longis; lobis terminalibus elongatis et acuminatis, lobis lateralibus sæpe triangularibus.

Plant shrubby, forming a prostrately spreading or less frequently a dome-like mass: twigs much branched and precocious, becoming a meter long in vigorous plants, green to dull brownish-purple, stellate-hairy, often sparsely so, the hairs 4–6-rayed; internodes 3–20 mm. long: leaves green with paler midrib, lateral veins not prominent, usually 3–5-lobed, about 2.0–3.0 cm. long; terminal lobe broadest above the base, acuminate and elongate; lateral lobes triangular and larger than basal lobes when latter are present; apices bluntly acute; bases truncate to cordate; margins entire, the surface of the blade usually somewhat canaliculate from above caused by the folding upward of the lateral lobes: petioles 1–2 cm. long, green or reddish-purple basally.

This plant belongs to Bates' Ramosa complex and while the above description is at variance in several respects with that given by him for var. Green Feather, there is no doubt that the same plant is under discussion in both instances. None of our mature plants has the short internodes of $\frac{1}{8}$ inch or less (3 mm.) nor leaves not exceeding $\frac{3}{4}$ inch in length (2 cm.) nor most of the leaves without basal lobes. In its leaf shape it is unlike any other ivy clon known to us. Plants growing outdoors for several seasons in Ithaca, New York have larger leaves than indicated in Fig. 81-A and with their lateral lobes pointing distinctly forward.

Bates refusal to accept a Latin name for this plant is groundless. We have already explained the situation on page 115. The facts of the case

are that Fred Danker of Albany, New York, the introducer of the clon, first used the name Meagheri for the plant (in honor of an employee who first recognized it), but never properly published it. For this reason, we include here a Latin diagnosis of the clon and validate Danker's original name. To rename it with a vernacular name is contrary to accepted horticultural practices and inconsistent with the basic principles of plant nomenclature.

A very closely related form is distributed in the trade as var. Pin Oak. Contact with W. I. Thomas of the firm of Henry Faust Inc. of Merion, Pennsylvania, revealed that "Pin Oak ivy originated at Merion [and] was first placed on the market during the spring of 1941. This variety was not quite satisfactory. During [the] Philadelphia Flower Show of 1942 we introduced another similar but hardier variety known as Pin Oak Ivy Improved . . . thus far neither of these varieties have been featured in any trade paper or catalogue." The plants we have as Pin Oak (received from the firm of Dauerheim Inc. of Wantagh, New York) differ from var. *Meagheri* in the more dense foliage with the leaves flat and not acutely concave above, predominately 3-lobed or occasionally unlobed, with the lateral lobes (when present) short, strongly divergent from the midrib and acutely deltoid in outline and in the terminal lobe lanceolate and not constricted at the base.

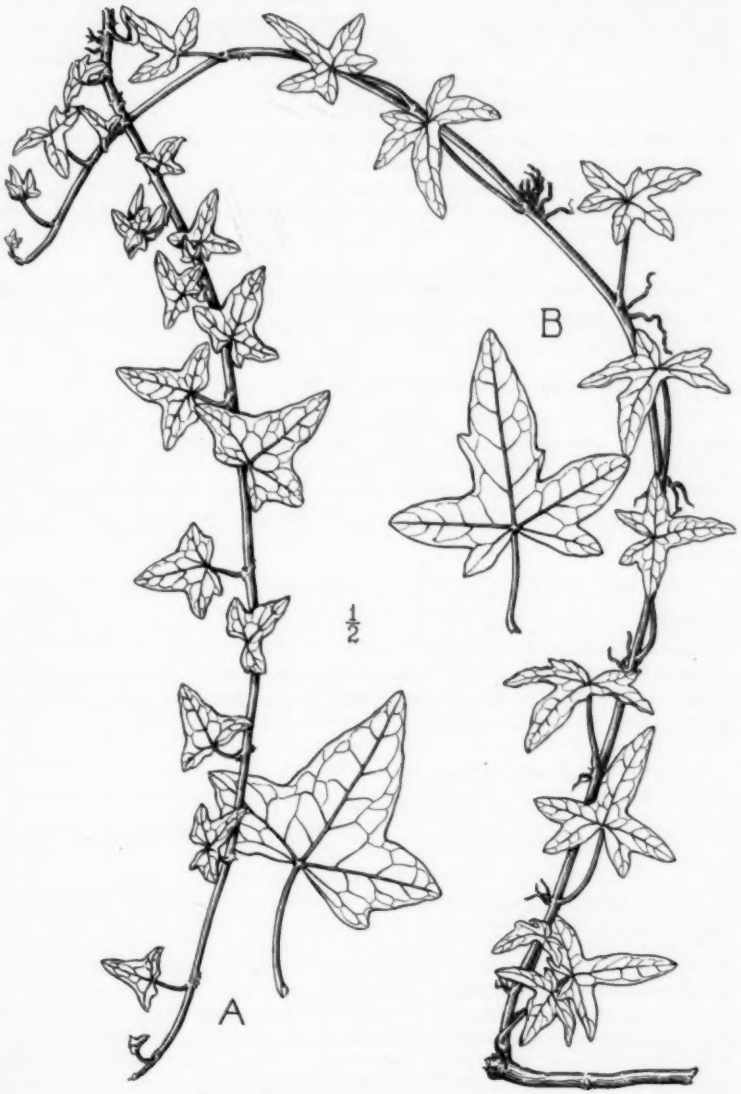
22. **H. Helix** var. RUSSELL GOLD.

Similar to typical *H. Helix*, but differing in the leaves of the twigs, as contrasted to those of stems (see page 115), being sap-green (cf. Roy. Hort. Soc. Color Chart) while those of the stems are, as in typical *H. Helix*, a dark blackish-green. Further in Russell Gold, many of the young leaves have the long terminal lobe so characteristic of vars. *triloba* and *minima*, but this is less conspicuous as they approach maturity. The twigs are more slender and flexuous than typical *H. Helix* and, in the plants of the Cornell collection, the aerial rootlets are produced very sparsely with many twigs showing no indication of their emergence.

Our material of this clon was donated by C. McK. Lewis of Skylands Farm at Sloatsburg, New York, and Stuart Longmuir informs us that their stock was obtained originally in June 1934 from the firm of L. R. Russell Ltd., of Richmond, England.

23. **H. Helix** var. HOLLY.

This is a member of the Ramosa complex (see page 115) characterized by stout and vigorous brownish-purple or greenish twigs having internodes 1–4 cm. long, axillary shoots abundantly and precociously produced: leaves bright green with green raised veins, obtusely or subacutely 5–7-lobed, mostly 1.5–8.0 cm. long; terminal lobe triangular and sometimes slightly longer than wide, lateral lobes distinct, their sinuses often shallow, basal lobes broad and not so conspicuous; apices bluntly acute to obtuse;



82. HEDERA HELIX. Juvenile foliage of A, var. *minima;* B, var. *pedata:* single leaf of each shown natural size.

bases deeply cordate; blade strongly undulate, the basal and lateral lobes turned upward and often forming a deep concavity, margins occasionally recurved: petioles usually 1–5 cm. long, tinged reddish-purple, at least basally.

24. **H. Helix** var. Maple Queen.

Twigs and petiole bases reddish, internodes 1.5–2.0 cm. long: leaves 1.0–3.5 cm. long, light green and often with reddish-brown variegations between the pale greenish-yellow veins, mostly 3-lobed, the terminal lobe about as broad as wide, lower side of lateral lobes concave, basal lobes never well-developed; apices bluntly acute or those of lowermost leaves obtuse; bases truncate.

This plant was issued United States Patent number 429. The patent rights were assigned to the originator, Sylvan Hahn of Pittsburgh, Pennsylvania, as of October 15, 1940.

25. **H. Helix** var. Sylvanian. Fig. 81-D.

Twigs reddish, petioles tinged reddish basally or sometimes green throughout; internodes 1.0–2.5 cm. long: leaves mostly 2.5–6.5 cm. long, light green with yellowish-green veins, essentially 3–5-lobed, the terminal lobe longer than broad, lateral lobes spreading almost at right angles to it and with convex sides, basal lobes much reduced in small leaves and broadly rounded in large ones; apices bluntly acute; bases shallowly to deeply cordate.

Originated by Sylvan Hahn of Pittsburgh, Pennsylvania, and the assignee of United States Patent number 430 issued to him on October 15, 1940. This plant has since been distributed and referred to in the horticultural literature as Sylvan Beauty, but according to the second edition of Standardized Plant Names (page 466) it was patented under the name Sylvanian.

† 26. **H. Helix** var. **triloba** (Hibb.) Lawr. stat. nov.

H. Helix triloba Hibb., The Ivy, 72 (1872).

H. Helix cuspidata minor Nichols., Ill. Dict. Gard. ii, 121 (1885).

Twigs reddish-purple, densely gray-stellate-hairy toward tips, internodes 2–4 cm. long: leaves dark green with white raised veins and on the older leaves the veins bordered by a narrow grayish zone, 2.5–5.5 cm. long; almost all leaves of a given plant 3-lobed, or rarely a few leaves with small basal lobes, the terminal lobe usually triangular (i.e. deltoid) and slightly longer than wide and some leaves with terminal lobes narrowly lanceolate and 3–4 times as long as wide; basal lobes mostly absent, the 3-lobed leaves possessing terminal and lateral lobes only; apices acute; bases generally subtruncate or shallowly cordate; margins undulate: petioles 2–4 cm. long, usually reddish-purple along basal third.

This clon blends almost imperceptibly with var. *minima* and there is considerable question in our minds as to whether it is worthy of separation.

We have seen no large plants of one of these clons that did not bear a dozen or more leaves of the other: the foliage of var. *minima* represents the extreme, having narrowly lanceolate terminal lobes while that of var. *triloba* is at the other end of the series and has broadly triangular terminal lobes. The twigs of var. *triloba* are, or seem to be, less flexuous than those of var. *minima*. In their extremes the plants are of very different aspect, even though they produce a few leaves of the other variant.

27. **H. Helix** var. **minima** (Hibb.) Rehd. in Bailey, Stand. Cyclo. Hort., 1438 (1915). Fig. 82-A.

H. Helix minor Donerailense Hibb. in Fl. World, vii, 58 (1864), *nomen subnudum*.

H. Helix donerailensis minor Paul, in Gard. Chron., 1867, p. 1215, *nomen subnudum*.

H. donerailensis K. Koch, Dendr. i, 680 (1869), *pro syn*.

H. Helix minima Hibb., The Ivy, 76 (1872).

H. Helix Donerailensis Nichols., Ill. Dict. Gard. ii, 121 (1885).

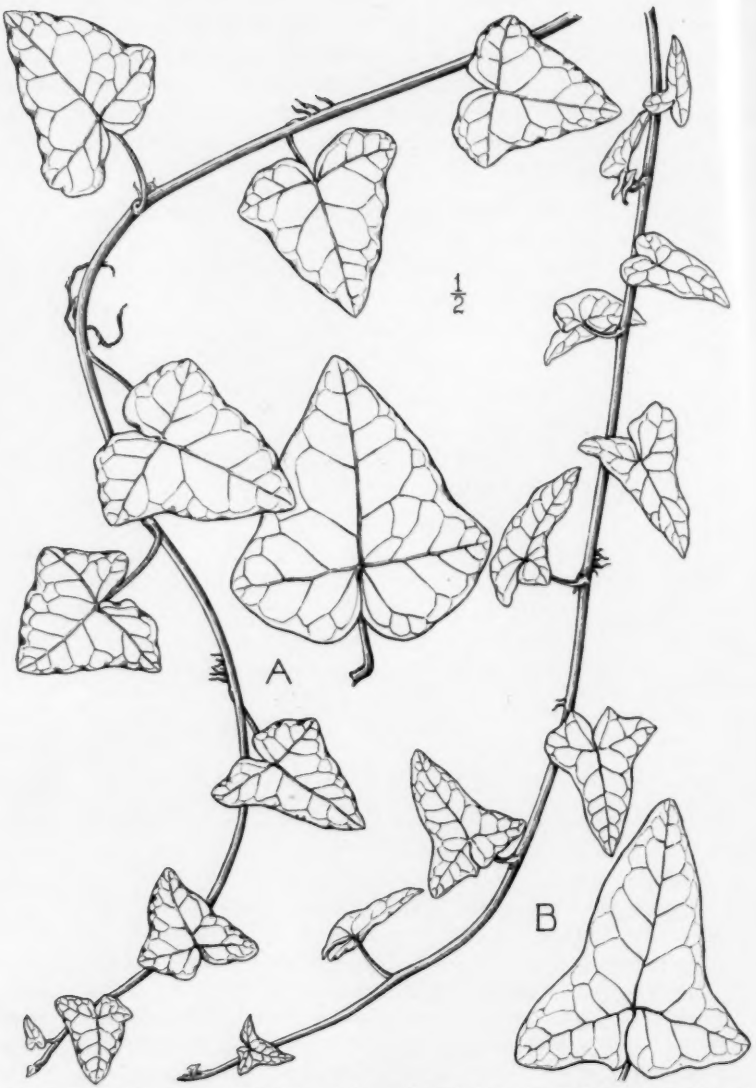
H. Helix var. *atropurpurea* Hort.

H. Helix f. *minima* Tobler, in Mitt. Deutsch. Dendr. Ges., 1927, p. 29.

Twigs green to dark reddish-purple, flexuous, gray-stellate-hairy, hairs 4–6-rayed; internodes 2–5 cm. long: leaves dark green with white raised veins, mostly 2.0–7.5 cm. long, usually 3- but occasionally 5-lobed, the terminal lobe typically lanceolate and 3–6 times as long as wide, but some leaves of a given plant often shorter and more triangular, the terminal lobe broadest at the base; lateral lobes larger than basal lobes and typically having the narrow proportion of terminal lobe; apices acute; bases cordate, often sharply and deeply so; margins undulate: petioles 1.5–2.5 cm. long, green.

Although closely resembling var. *pedata*, the var. *minima* is a less stable clon and much less sharply defined. We have not been able to confine it solely to those plants having only the very small leaves described in the original diagnosis, but find that every large plant having branches 7 or 8 feet long or more has leaves from ¾–5 inches in length. On some mature plants of this size there will be as many as a third of the leaves with deltoid terminal lobes rather than the narrowly lanceolate lobes figured by Hibberd in The Ivy. The var. *minima* intergrades in the other direction with var. *triloba*, but may be distinguished from the latter by its deeply cordate leaf-bases and the presence of some leaves of five rather than three lobes. In var. *triloba* leaves having lanceolate terminal lobes are rare.

There is a misconception on the part of many that var. *minima* must of necessity have small leaves or that the terminal lobes in all cases must be narrowly lanceolate. Because of the wide variation in the outlines of leaves



83. HEDERA HELIX. Juvenile foliage of A, var. *helvetica;* B, var. *sagittæfolia:* single leaf of each shown natural size.

of a given plant we have been obliged to broaden the description from that of Hibberd so that, as now circumscribed, plants of var. *minima* may have leaves to 5 inches long. Some leaves may have terminal lobes that are essentially triangular in outline and these may be more abundant than those with narrowly lanceolate terminal lobes.

Specimens observed growing to heights of 25 feet on a brick building in Ithaca have leaves 5 inches long.

28. **H. Helix** var. **sagittæfolia** Paul, in Gard. Chron., 1867, p. 1215. Fig. 83-B.

H. Taurica Hibb. in Fl. World, vii, 58 (1864).

H. Taurica Leeana Hibb. l.c.

H. Sagittæfolia Hibb. l.c.

H. Helix var. *taurica* Paul, l.c., *nomen subnudum.*

H. Helix angularis Hibb., The Ivy, 74 (1872).

?*H. Helix contracta* Hibb. op. cit., 70.

H. poetarum? var. *taurica* Tobler, Gatt. Hedera, 42 (1912).

H. Helix var. *taurica* Rehd., Manual Cult. Trees & Shrubs, Ed. 1, 659, (1927), non Paul?

H. Helix f. *sagittæfolia* Tobler, in Mitt. Deutsch. Dendr. Ges., 1927, p. 32.

Twigs reddish-purple to pale reddish-brown; hairs stellate, 4–12-rayed but mostly of 8 rays; internodes of variable length from 1–5 cm. long: leaves hairy, dull green and often pale, mostly obscurely 5-lobed with an elongated triangular-oblong terminal lobe, conspicuous lateral lobes and 2 small basal lobes, the lateral lobes hastately arranged (erroneously interpreted as sagittate by many authors); blades 2–5 cm. long, the terminal lobe twice as long as wide or longer; apices acute; bases deeply cordate to hastate, the lobes overlapping, at least at base; margins entire or undulate: petioles 0.6–4.0 cm. long, reddish: adult foliage similar to that of typical *H. Helix*, but differing in the 8–12-rayed stellate hairs: fruiting specimens not seen in living condition, but fruit reported to be yellow.

It is here proposed, for the first time, that the *H. Helix* var. *sagittæfolia* of horticulturists and the var. *taurica* of Tobler and of Rehder are the same entity despite doubts published by Tobler to the contrary.

Tobler's plants came from the wild in Crimea (Tauria) and are deposited in the Leningrad herbarium. We find nothing in his description or illustrations that conflicts seriously with material of var. *sagittæfolia* in cultivation. Of the latter Tobler (1927) stated (translation ours) "this garden form is probably not var. *taurica* of *H. Poetarum* Bertol., which is possibly a hybrid with *H. colchica*, but rather a small-leaved plant of the *minima* and *angularis* affinity." Outline sketches of leaves and hairs published by Tobler agree perfectly with living material now before us, nor do they

contradict any of the early horticultural descriptions. There is little doubt that var. *sagittæfolia* is as distinct a botanical variety as horticultural; the fact that it has its own restricted geographical distribution adds to this view. The plant does not behave as a clon in the horticultural sense.

For the sake of stability it would be desirable to retain the name "taurica" for this plant; however, there seems to be no alternative but to accept Paul's name of 1867 as the oldest varietal epithet. Hibberd did not recognize his own *H. Taurica* of 1864 as being worthy of more than relegation to synonymy by the time he published The Ivy in 1872. William Paul published the combination of *H. Helix* var. *taurica* at the same time as his var. *sagittæfolia*, but the former is treated by us as a *nomen subnudum* inasmuch as his all too brief description accompanying the name is "leaves dark green, of medium size. Growth rapid."

29. **H. Helix** var. **pedata** (Hibb.) Rehd. in Bailey, Stand. Cyclo. Hort., 1438 (1915). Fig. 82-B.

H. Helix pedata Hibb., The Ivy, 76 (1872).

?*H. Caenwoodiana* Haage & Schmidt, Trade Catalogue (1876), *nomen subnudum*.

H. Helix digitata Nichols., Ill. Dict. Gard. ii, 121 (1885) and Rehd. in Möllers Deutsch. Gart.-Zeit. xii, 229 (1897), non Loud.

H. Helix Caenwoodiana Nichols., Ill. Dict. Gard. ii, 121 (1885), *pro syn.*

H. Helix f. *pedata* Tobler, in Mitt. Deutsch. Dendr. Ges., 1927, p. 30.

Twigs green and sometimes with purplish areas, slenderly flexuous, stellate-hairy, often sparsely so; internodes 2.5 cm.; aerial rootlets usually at nodes: leaves coriaceous, usually 5-lobed, about 2.5–5.0 cm. long, bright apple-green becoming much darker, veins white and raised; terminal lobe deeply lanceolate and usually 3–6 times as long as wide, frequently broadest about ⅓ of its length above the base, often with 1–2 marginal teeth; lateral lobes narrow and longer than basal lobes; margins finely undulate; apices acute; bases broadly cordate to sagittate or subhastate: petioles 1.5–3.5 cm. long, green or slightly purplish basally.

This clon is sometimes confused with the material here grouped under var. *minima* because, like the latter, its distinguishing characters as outlined in the key are not constant and are not true of all the leaves on any given plant. Living plants identified by us as var. *pedata* have always borne a number of leaves that were indistinguishable from those of var. *minima* although the larger part would agree with the above description. There is no doubt that this variety, as now represented by material in the trade, is weak and lacks uniformity. Knowing this, commercial growers well might

be more critical of their stocks and select only the most typical material for propagation.

It is listed by four domestic plantsmen as var. *pedata*. Eight firms list *H. Helix* var. *Caenwoodiana* (sometimes spelled var. *Caenwoodii*).

30. **H. Helix** var. **digitata** (Loud.) Bosse, Vollst. Handb. Blumengärt. Ed. 2, ii, 220 (1841). Fig. 84-A.

H. Helix var. *digitata* Lodd. ex Loud. Arb. et Frut. Brit. ii, 1000 (1838), *nomen*.

H. Helix pennsylvanica Hibb. in Fl. World, vii, 58 (1864).

H. Helix β *Hodgensii* Moore & More, Contr. Cybele Hiber., 135 (1866).

H. Helix var. *palmata* Paul, in Gard. Chron., 1867, p. 1215.

H. Helix var. *digitata nova* Paul, l.c.

H. palmata Carr. in Rev. Hort. lxii, 163 (1890).

H. digitata Amer. hort.

Plant with twigs green, densely covered with gray-canescent 4–6-rayed stellate hairs, at least terminally; aerial rootlets generally produced in abundance; internodes mostly 3–5 cm. long: leaves 5–7-lobed, mostly 1.7–4.5 cm. long and usually wider than long; surface flat or concave, not strongly undulate, dull dark green with grayish-white veins; terminal lobe about equal in shape and size to lateral lobes, the basal lobes equal to lateral lobes or smaller; apices acute; bases shallowly to deeply cordate; sinuses often extending half way from lobe apex to base of midrib, mostly acute: petioles green, usually 1.5–4.0 cm. long.

Probably first recognized in Ireland, and we quote from Moore & More l.c.: "This variety, made known by Mr. Hodgens, and noticed by Dr. Mackay (Fl. Hibernica, p. 135, 1836) is closely allied to the 'palmate' Ivy often cultivated in gardens. . . . This ivy is said to have been found growing wild near the former Nursery Gardens at Dungas town, Wicklow, and is, we believe, the same plant which is often inserted in nurserymen's catalogues as *H. Helix* var. *incisa*. . . ."

The clon, while distinct in its extreme variation, merges directly with the typical *H. Helix*. Specimens intermediate between the two are not uncommon. It is characterized by its essentially flat leaf surface and the uniform lobing. Five plantsmen have offered it during the last decade as var. *digitata*, two as *H. digitata* and one as *H. palmata*.

Shirley Hibberd divided the element here treated as var. *digitata* in two, calling one *palmata* and the other *digitata*. He figured the latter as having 5–7-lobed leaves with narrow sinuses and the lobes essentially equal in length. His *H. Helix palmata* is indicated to have leaves usually 5-lobed and with broad sinuses and the terminal lobe longer and slightly broader than the lateral lobes. There is in the trade an unnamed clon that

84. HEDERA HELIX. Juvenile foliage of A, var. *digitata;* B, var. *crenata.*

we have referred to this variant but which differs in the lobes rounded at their apices and the sinuses relatively shallow: it may be a distinct clon and does bear a resemblance to the palmately lobed leaves occasionally encountered in *H. canariensis* var. *viridis*, although the plant does not belong to the latter species.

† 31. **H. Helix** var. **palmato-aurea** Lawr. var. nov.

H. Helix palmata aurea Hibb. in Fl. World, vii, 71 (1864).

H. Helix var. *chrysophylla palmata* Hibb. in Journ. Roy. Hort. Soc. xii, 393 (1890).

Differt ab *H. Helix* var. *digitata* in foliis aureis vel aureis marginatis.

Differs from var. *digitata* in the leaves blotched, streaked or margined yellow; often apparent only in the younger leaves when the yellow coloration may spread throughout the blade and at leaf maturity become a yellowish-green. Not common in cultivation and no living material seen although several sheets clearly referable to it are in the Arnold Arboretum herbarium.

32. **H. Helix** var. **crenata** (Hibb.) Rehd. in Bailey, Cyclo. Amer. Hort., 716 (1900). Fig. 84-B.

H. Helix crenata Hibb., The Ivy, 74 (1872).

H. Helix corrugata Hibb. op. cit., 90.

Similar to var. *digitata*, differing in aerial rootlets less abundant, twigs stouter: leaves somewhat glossy, strongly undulate (not crenate as Hibberd's name would imply), generally 2.0–6.0 cm. long and the base truncate to cordate or rarely subcuneate: petioles usually 2.0–5.5 cm. long or longer on young vigorous twigs.

This clon is an advanced development over var. *digitata* and appears to be the prototype of var. *Glymii*. In many plants the leaves are less deeply lobed than in var. *digitata* and as they mature it is not unusual to find individual twigs bearing leaves that are unlobed, only serrately undulate and scarcely distinguishable from var. *Glymii*. It is in the trade under the names of other recognized varieties although no American dealer is known by us to have offered it under its own name during the past decade.

33. **H. Helix** var. **conglomerata** (Haage & Schmidt) Rehd. in Bailey, Cyclo. Amer. Hort., 716 (1900). CLUSTERED IVY. Fig. 85-B.

H. conglomerata Haage & Schmidt, Trade Catalogue (1875), *nomen subnudum*.

H. Helix conglomerata Nichols., Ill. Dict. Gard. ii, 121 (1885).

H. Helix f. *conglomerata* Tobler, in Mitt. Deutsch. Dendr. Ges., 1927, p. 21.

Stems and twigs stout, erect or ultimately becoming contorted and fall-

ing to the ground forming a dome-like mound of foliage; twigs green suffused with reddish-purple, densely gray-stellate-hairy, hairs 4–6-rayed; aerial rootlets abundant; internodes 4–8 mm. long, the leaves often two-ranked: leaves dull dark green, triangular to ovate, usually 1.2–3.5 cm. long and generally longer than broad; lobes 3–5, the laterals often missing; apices rounded or bluntly acute; bases deeply cordate, the basal lobes forming an obtuse and spreading sinus; surface very strongly and stiffly undulate; veins green, raised: petioles 6–15 mm. long.

The Clustered ivy is one of the two closely allied but distinct variants that have not been observed to merge directly with other named clons. Their stability is marked and they may be recognized by their stiff and often erect stems, the small and mostly two-ranked leaves which are strongly undulate or concave and crowded by the short internodes.

The name *conglomerata* was not known either to Paul or Hibberd (at least not until after 1872) and it is surprising that so marked and stable a variant should be of such relatively recent origin, or, if older, should have escaped their attention. Through the kindness of Dorothy Manks, Librarian at the Massachusetts Horticultural Society library, we have been able to locate a copy of Haage & Schmidt's catalogue of 1875. The binomial credited to them by Tobler is scarcely even a *nomen subnudum*. The editors of Standardized Plant Names (1941) would call this the "Bunchleaf ivy" without apparent study of the older literature where it is referred to commonly as the Clustered ivy (cf. The Garden, xix, 176, et al). While the name *conglomerata* was not mentioned by Hibberd 1872 (The Ivy) it was mentioned in the London Gardeners' Chronicle of June 10, 1871 (page 744) under an anonymous Royal Horticultural Society note which stated in part, ". . . a new ivy, named *Hedera conglomerata*, was then alluded to as being an interesting addition to this class of plants, on account of its distinct habit."

† 34. **H. Helix** var. **erecta** Schulze, var. nov. Fig. 85-A.

Valde affinis *H. Helix* var. *conglomerata* Nichols. ab differt in foliis non undulatis sed caniculatis et apices acutis; caule erecti.

Very similar to var. *conglomerata*, differing primarily in the leaves strongly canaliculate with lobes and apices acute, the stems erect and rarely contorted. In general, the leaves are more conspicuously two-ranked than in var. *conglomerata* and also have shallower lateral lobes and wider sinuses.

The largest specimens seen by us were scarcely 2 feet high and not at all bushy in character. The plant has been distributed to the trade under the label names of *Hedera conglomerata erecta*, *Hedera erecta* and *Hedera Helix erecta*.

35. **H. Helix** var. **deltoidea** (Hibb.) Rehd. in Bailey, Cyclo. Amer. Hort., 716 (1900). Fig. 86-A.

H. Helix deltoidea Hibb., The Ivy, 71 (1872).

85. HEDERA HELIX. Juvenile foliage of A, var. *erecta*, single leaf above; B, var. *conglomerata*, single leaf at the left.

Twigs pale purplish-red to green, gray-stellate-hairy, the hairs 4–6-rayed; internodes 1–2.5 cm. long: leaves dull dark green, veins greenish-gray and scarcely or not at all raised, outline ovate to obtusely triangular, usually 1.5–7.5 cm. long with the majority not much exceeding 4 cm. in length; terminal lobe often not distinguishable; basal and lateral lobes generally confluent and not separable from one another, basal lobes rounded, the sinus deep and lobes overlapping; apices mostly rounded, rarely acute and never known to be predominantly so; bases deeply cordate; margins entire or slightly undulate, the blade surface often somewhat concave: petioles 1–6 cm. long, but usually not exceeding 2 cm. in length, green or slightly tinged purplish basally.

A very distinct clon, readily distinguished by the rounded outline of its leaves and the overlapping of the basal lobes. It is not known by us to be listed as *deltoidea* by any domestic firms although much of the material received as "cordata" is this variety.

† 36. **H. Helix** var. **helvetica** Lawr. var. nov. SWISS IVY. Fig. 83-A.

Differt ab var. *sagittæfolia* foliis plerumque acutis, lobis lateralibus brevioribus, venarum lateralium angulis non obtusis et lobis terminalibus latioribus.

Twigs and petioles green or tinged purplish: leaves ovate-hastate in outline, usually 2.5–7.0 cm. long, medium to dark green with white or greenish veins, essentially 3-lobed with basal lobes scarcely distinguishable from lateral lobes; terminal lobe nearly half again as long as wide or longer, its sides strongly convex, primary vein to lateral lobe forming a right angle or less with midrib; bases deeply cordate and, in many leaves of any given plant, the lobes slightly overlapping; apices acute.

In a note by Edgar Anderson published in the Bulletin of the Arnold Arboretum (Ser. III, vi, 6, 1932) we learn that this form was brought from Switzerland to Massachusetts by a member of the Agassiz family and was then established on the Leyland estate at West Manchester, Massachusetts, where it was reported to be very hardy. Hybrids have been produced between this and the Baltic ivy. It is known in several collections as *H. Helix Leyland*, but because of its Swiss horticultural origin we have here proposed to call it var. *helvetica*.

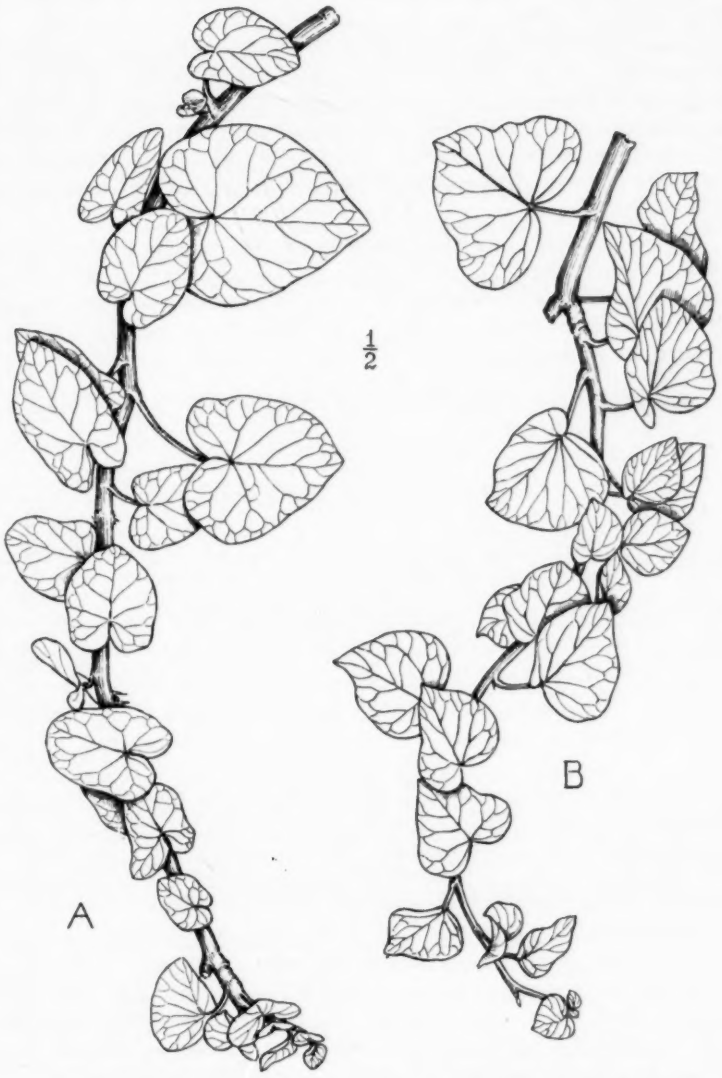
37. **H. Helix** var. **Glymii** Paul, in Gard. Chron., 1867, p. 1215. Fig. 86-B.

H. Helix tortuosa Hibb., The Ivy, 67 (1872).

H. cordata Carr. in Rev. Hort. lxii, 164 (1890).

H. Helix f. *Glymii* Tobler, Gatt. Hedera, 128 (1912).

Twigs green, stout, scandent, gray-stellate-hairy, hairs mostly 4–6-rayed; aerial rootlets abundant, at most nodes; internodes 6–15 mm. long: leaves apple-green and glossy, usually 1.5–4 cm. long and generally broader than long, triangular to ovate in outline, seemingly unlobed but the cordate bases providing 2 basal lobes; apices acute to acuminate; bases deeply cordate to broadly subcuneate, the lobes not or only rarely overlapping;



86. HEDERA HELIX. Juvenile foliage of A, var. *deltoidea;* B, var. *Glymii*.

margins slightly undulate or not at all so; veins green, raised basally; petioles 1–4 cm. long.

It seems probable that this variety represents a degree of transition between the juvenile and adult stages of *H. Helix*. Its leaf outline is more suggestive of those on arborescent fruiting branches but its scandent twigs, with aerial rootlets, clearly keep it as a representative of the juvenile stage. That it is a development from var. *crenata* is apparent from the occasional shoots referable to var. *Glymii* found on the undulate-digitate-leaved plants of var. *crenata*.

The origin of the name Glymii is unknown. No American nurseryman is known to have offered the plant during the past decade under this name and only one British firm has listed it, yet it is not uncommon in cultivation although most frequently labelled *H. scutifolia* or var. *scutifolia* and distributed by one large nursery as *H. Linsii*.

38. **H. Helix** var. **poetica** Weston, in The Univ. Bot. & Nurseryman, i, 123 (1770).

H. chrysocarpa Walsh, in Trans. Hort. Soc. Lond. vi, 42 (1826).

H. poetarum Bertoloni, Prael. Rei Herbar., 78 (1827); Fl. Ital. ii, 688 (1835).

H. Helix var. *chrysocarpa* Tenore ex Caruel, Prod. Fl. Tosc., 300 (1860), non DC. (1830).

H. Helix Baccifera lutea Hibb. in Fl. World, vii, 58 (1864).

H. Helix poetica Hibb. l.c.

H. Helix arborescens baccifera lutea Hibb. op. cit. 59.,

H. Helix β poetica Halacy, Conspect. Fl. Graec. i, 694 (1901).

H. Helix chrysocarpa, Fiori & Paol., Fl. Analyt. Ital. ii, 137 (1915).

H. Helix spp. *poetarum* Hayek, Prod. Fl. Balcan. i, 955 (1927).

Twigs green or tinged reddish-purple: leaves broadly ovate, usually with 3–5 shallow lobes, bright green or sometimes yellowish; apices acute; bases shallowly cordate or subtruncate; margins undulate: leaves of adult stage entire, unlobed and with obtuse bases: fruit yellow.

Native of southeastern Europe and Asia Minor and more especially of south and central Italy, eastward through Greece, the island of Crete, north into Transcaucasia and eastward. The eastern limit does not appear clearly defined, due to an inability to determine naturalized material from native occurrences. Specimens have been examined that were collected as far east as Istambul, Turkey.

We have not seen living fruiting specimens of this variety although several collections from the wild have been observed.

FINDING-LIST OF HEDERA NAMES

Valid names are indicated in bold face; all other names are invalid. Names following invalid listings are those to which the invalid names are referred. Page numbers follow the valid names.

H. Algeriensis Hibb. 1864: H. canariensis typica.
H. Algeriensis Hibb. var. *variegata* Paul 1867: H. canariensis variegata.
H. arborea Carr. 1890: H. Helix typica.
H. arborea intermedia Carr. 1890: H. Helix typica.
H. arborea microphylla Carr. 1890: H. Helix typica.
H. arborea variegata Hibb. 1858: H. Helix Cavendishii.
H. azorica Carr. 1890: H. canariensis typica.
H. Caenwoodiana Haage & Schmidt 1876: H. Helix pedata.
H. canariensis Hibb. 1864: H. Helix hibernica.
H. canariensis Willd. 1808: page 124.
H. canariensis Koch var. *arborescens* Paul 1867: H. canariensis typica.
H. canariensis aureo maculata Paul 1867: H. canariensis viridis.
H. canariensis var. *azorica* Bean 1914: H. canariensis typica.
H. canariensis var. CANARY CREAM: page 127.
H. canariensis var. Gloire de Marengo Hort.: H. canariensis variegata.
H. canariensis Hibb. var. *maculata* Hibb. 1890: H. Helix maculata.
H. canariensis var. **margino-maculata** Lawr.: page 128.
H. canariensis var. **striata** Lawr: page 128.
H. canariensis var. **variegata** (Paul) Schulze: page 128.
H. canariensis var. **viridis** (Hibb.) Lawr.: page 127.
H. chrysocarpa Walsh 1826: H. Helix poetica.
H. cinerea Bean 1914: H. nepalensis.
H. colchica K. Koch 1859: page 122.
H. colchica Seem. not Koch 1868: H. nepalensis.
H. colchica Seem. 1864: H. rhombea.
H. colchica Koch var. *arborescens* Paul 1867: H. colchica.
H. colchica var. **dentata** (Hibb.) Lawr.: page 124.
H. colchica f. *dentata* Hibb. 1890: H. colchica dentata.
H. colchica var. **dentato-variegata** Schulze: page 124.
H. colchica β rhombifolia Boiss. 1872: H. colchica typica.
H. communis S. F. Gray 1821: H. Helix typica.
H. communis β sterilis S. F. Gray 1821: H. Helix typica.
H. conglomerata Haage & Schmidt 1875: H. Helix conglomerata.
H. cordata Carr. 1890: H. Helix Glymii.
H. cordifolia Hibb. 1869: H. colchica.
H. coriacea Hibb. 1872: H. colchica.
H. coriacea dendroides Hibb. 1872: H. colchica.
H. coriacea dentata Hibb. 1872: H. colchica dentata.
H. digitata Amer. Auth.: H. Helix digitata.
H. donerailensis Koch 1869: H. Helix minima.
H. grandifolia Hibb. 1872: H. canariensis typica or H. Helix hibernica.
H. grandifolia maculata Hibb. 1872: H. Helix maculata.
H. grandifolia pallida Hibb. 1872: H. canariensis viridis.
H. grandifolia variegata Hibb. 1872: H. canariensis variegata.
H. grandifolia viridis Hibb. 1872: H. canariensis viridis.
H. Helix Linn.: page 131.
H. Helix Thunb. not Linn. 1874: H. rhombea.
H. Helix Wallich in Roxb. 1824: H. nepalensis.
H. Helix Linn. var. ALBANY: page 151.
H. Helix angularis Hibb. 1872: H. Helix sagittæfolia.
H. Helix arborea Schelle 1903: H. Helix typica.
H. Helix arborescens Loud. 1838: H. Helix typica.
H. Helix arborescens alba lutescens Hibb. 1864: H. Helix Cavendishii.
H. Helix arborescens albo-lutea Paul 1867: H. Helix Cavendishii.
H. Helix arborescens aurea maculata Hibb. 1864: H. Helix aureo-variegata.
H. Helix arborescens aureum Hibb. 1864: H. Helix aureo-variegata.
H. Helix arborescens baccifera lutea Hibb. 1864: H. Helix poetica.
H. Helix arborescens foliis aureis Paul: H. Helix aureo-variegata.

H. Helix arborescens marginata argentea Hibb. 1864: H. Helix Cavendishii.
H. Helix arborescens minor lutea Hibb. 1864: H. Helix aureo-variegata.
H. Helix argentea major Hibb. 1872: H. Helix Cavendishii.
H. Helix argentea minor Hibb. 1872: H. Helix Cavendishii.
H. Helix aruntiaca Hibb. 1864: H. Helix aureo-variegata.
H. Helix atropurpurea Hort.: H. Helix minima.
H. Helix aurea Hibb. 1872: H. Helix aureo-variegata.
H. Helix aurea densa Hibb. 1864: H. Helix aureo-variegata.
H. Helix aurea densa minor Hibb. 1869: H. Helix aureo-variegata.
H. Helix aurea maculata Hibb. 1864: H. Helix aureo-variegata.
H. Helix var. *aureo-marginata* Dick 1911: H. Helix aureo-variegata.
H. Helix Linn. var. **aureo-variegata** Weston 1770: page 148.
H. Helix aureola Hibb. 1890: H. Helix aureo-variegata.
H. Helix baccifera lutea Hibb. 1864: H. Helix poetica.
H. Helix Linn. var. **baltica** Rehd. 1915: page 141.
H. Helix Caenwoodiana Nichols. 1885, *pro syn.*: H. Helix pedata.
H. Helix β canariensis DC. 1830: H. canariensis typica.
H. Helix Linn. var. **Cavendishii** Paul: page 145.
H. Helix f. *Cavendishii* Tobler, 1927: H. Helix Cavendishii.
H. Helix β chrysocarpa DC. 1830: H. nepalensis.
H. Helix var. *chrysocarpa* Tenore ex Caruel 1860: H. Helix poetica.
H. Helix var. *chrysocarpa* Fiori & Paol.: H. Helix poetica.
H. Helix chrysocarpa Hibb. 1872: H. Helix poetica.
H. Helix chrysocarpa Hibb. 1864: H. nepalensis.
H. Helix chrysophylla Hibb. 1872: H. Helix aureo-variegata.
H. Helix chrysophylla palmata Hibb. 1890: H. Helix palmato-aurea.
H. Helix cinerea Hibb. 1872: H. nepalensis.
H. Helix β colchica K. Koch 1842: H. colchica.
H. Helix var. *colchica* Makino 1884: H. rhombea.
H. Helix Linn. var. **conglomerata** (Haage & Schmidt) Rehd.: page 163.
H. Helix conglomerata Nichols. 1885: H. Helix conglomerata.
H. Helix f. *conglomerata* Tobler 1927: H. Helix conglomerata.
H. Helix var. *conglomerata erecta* Hort.: H. Helix erecta.
H. Helix contracta Hibb. 1872: H. Helix sagittæfolia?
H. Helix corrugata Hibb. 1872: H. Helix crenata.
H. Helix crenata Hibb. 1872: H. Helix crenata.
H. Helix Linn. var. **crenata** (Hibb) Rehd.: page 163.
H. Helix Cullisii Haage & Schmidt 1869: H. Helix tricolor.
H. Helix f. *Cullisii* Tobler 1927: H. Helix Cavendishii.
H. Helix cuspidata minor Nichols. 1885: H. Helix triloba.
H. Helix var. *Dankeri* Hort.: H. Helix Albany.
H. Helix dealbata Hibb. 1872: H. Helix discolor.
H. Helix deltoidea Hibb. 1872: H. Helix deltoidea.
H. Helix Linn. var. **deltoidea** (Hibb.) Rehd.: page 164.
H. Helix dentata Nichols. 1885: H. colchica dentata.
H. Helix Linn. var. **digitata** (Loud.) Bosse: page 161.
H. Helix digitata Lodd. ex Loud. 1838: H. Helix digitata.
H. Helix digitata Nichols. not Loud. 1885: H. Helix pedata.
H. Helix var. *digitata nova* Paul 1867: H. Helix digitata.
H. Helix Linn. var. **discolor** (Hibb.) Lawr.: page 147.
H. Helix discolor Hibb. 1872: H. Helix discolor.
H. Helix Donerailensis Nichols. 1885: H. Helix minima.
H. Helix Donerailensis minor Paul 1867: H. Helix minima.
H. Helix elegantissima Hibb. 1872: H. Helix tricolor.
H. Helix Linn. var. Emerald Gem: page 144.
H. Helix Linn. var. **erecta** Schulze: page 164.
H. Helix ssp. *eu-Helix* Hayek. 1927: H. Helix typica.
H. Helix var *europea* Voss 1896: H. Helix typica.
H. Helix var. *europea* f. *melanocarpa* Voss. 1896: H. Helix hibernica.
H. Helix fasciata Hibb. 1890: H. Helix conglomerata?
H. Helix foliis aureis Loud. 1838: H. Helix aureo-variegata.
H. Helix Linn. var. **Glymii** Paul: page 166.
H. Helix f. *Glymii* Tobler 1912: H. Helix Glymii.
H. Helix Linn. var. **gracilis** (Hibb.) Rehd.: page 149.

H. Helix gracilis Hibb. 1864: H. Helix gracilis.
H. Helix var. Green Feather: H. Helix Meagheri.
H. Helix Linn. var. GREEN QUARTZ: page 150.
H. Helix Linn. var. HAHN SELF BRANCHING: page 151.
H. Helix Linn. var. HAHN MINIATURE: see H. Helix Merion Beauty.
H. Helix var. *Helfordensis* Hort: H. Helix typica.
H. Helix Linn. var. **helvetica** Lawr.: page 166.
H. Helix Linn. var. **hibernica** (Kirchn.) Jaeger: page 142.
H. Helix 4. *hibernica* Kirchn. 1864: H. Helix hibernica.
H. Helix hibernica Dippel 1893: H. Helix hibernica.
H. Helix himalaica Hibb. 1864: H. nepalensis.
H. Helix β Hodgensii Moore & More 1866: H. Helix digitata.
H. Helix Linn. var. HOLLY: page 154.
H. Helix var. *japonica* Lev. 1877: H. rhombea.
H. Helix latifolia Hibb. 1872: H. Helix typica.
H. Helix Linn. var. LEE SILVER: page 146.
H. Helix leucocarpa Hibb. 1872: H. Helix typica.
H. Helix Linn. var. **lobato-major** Lawr.: page 143.
H. Helix lobata major Hibb. 1864: H. Helix lobato-major.
H. Helix Linn. var. LONG POINT: page 150.
H. Helix lucida Hibb. 1872: H. Helix scutifolia.
H. Helix luteola Hibb. 1872: H. Helix aureo-variegata.
H. Helix Linn. var. **maculata** (Hibb.) Rehd. 1900: page 143.
H. Helix f. *maculata* Tobler 1912: H. Helix maculata.
H. Helix Linn. var. MAPLE QUEEN: page 156.
H. Helix marginata Hibb. 1872: H. Helix Cavendishii.
H. Helix marginata aurea Hibb. 1872: H. Helix aureo-variegata.
H. Helix marginata canescens Hibb. 1864: H. Helix Cavendishii.
H. Helix marginata Cullisii Hibb. 1864: H. Helix tricolor.
H. Helix marginata elegans Hibb. 1864: H. Helix Cavendishii.
H. Helix marginata elegantissima Hibb. 1864: H. Helix Cavendishii.
H. Helix marginata grandis Hibb. 1872: H. Helix Cavendishii.
H. Helix marginata latifolia Hibb. 1864: H. Helix aureo-variegata.
H. Helix marginata major Hibb. 1864: H. Helix tricolor.
H. Helix marginata minor Hibb. 1872: H. Helix Cavendishii.
H. Helix marginata pulchella Hibb. 1864: H. Helix tricolor.
H. Helix marginata robusta Hibb. 1864: H. Helix aureo-variegata.
H. Helix marginata rubra Hibb. 1872: H. Helix tricolor.
H. Helix marmorata Nichols. 1885: H. Helix discolor.
H. Helix f. *marmorata* Tobler 1927: H. Helix discolor.
H. Helix Linn. var. **Meagheri** Schulze: page 153.
H. Helix melanocarpa Hibb. 1872: H. Helix typica.
H. Helix Linn. var. MERION BEAUTY: page 151.
H. Helix minima Hibb. 1872: H. Helix minima.
H. Helix Linn. var. **minima** (Hibb.) Rehd.: page 157.
H. Helix f. *minima* Tobler 1927: H. Helix minima.
H. Helix minor Donerailense Hibb. 1864: H. Helix minima.
H. Helix minor marmorata Paul 1867: H. Helix tricolor.
H. Helix minor marmorata elegans Hibb. 1864: H. Helix discolor.
H. Helix var. *palmata* Paul 1867: H. Helix digitata.
H. Helix palmata aurea Hibb. 1864: H. Helix palmato-aurea.
H. Helix Linn. var. **palmato-aurea** Lawr.: page 163.
H. Helix pedata Hibb. 1872: H. Helix pedata.
H. Helix Linn. var. **pedata** (Hibb.) Rehd.: page 160.
H. Helix f. *pedata* Tobler 1927: H. Helix pedata.
H. Helix pennsylvanica Hibb. 1864: H. Helix digitata.
H. Helix Linn. var. PIN OAK: page 154.
H. Helix Linn. var. PITTSBURGH: page 149.
H. Helix ssp. *poetarum* Hayek: H. Helix poetica.
H. Helix poetica Hibb. 1864: H. Helix poetica.
H. Helix β poetica Halasy: H. Helix poetica.
H. Helix Linn. var. **poetica** Weston: page 168.
H. Helix subvar. *prostrata* Coss & Germ. 1861: H. Helix typica.
H. Helix Rægneriana Nichols. 1885: H. colchica typica.

H. Helix var. *rhombea* Miq. 1863: H. rhombea.
H. Helix var. "*rhombea variegata*" Rehd. 1900: H. rhombea variegata.
H. Helix var. Richmond Gem Hort.: H. Helix discolor?
H. Helix Linn. var. Russell Gold: page 154.
H. Helix Linn. var. **sagittæfolia** Paul 1867: page 159.
H. Helix f. *sagittæfolia* Tobler 1927: H. Helix sagittæfolia.
H. Helix Linn. var. **scutifolia** (Hibb.) Lawr.: page 144.
H. Helix scutifolia Hibb. 1872: H. Helix scutifolia.
H. Helix speciabilis aurea Auth.: H. Helix scutifolia *pro parti*.
H. Helix sub-lutea Hibb. 1872: H. Helix aureo-variegata.
H. Helix submarginata Hibb. 1872: H. rhombea variegata.
H. Helix succinata Hibb. 1872: H. Helix aureo-variegata.
H. Helix sulphurea Hibb. 1872: H. Helix aureo-variegata.
H. Helix var. Sylvan Beauty: H. Helix Sylvanian.
H. Helix Linn. var. Sylvanian: page 156.
H. Helix var. *taurica* Paul 1867: H. Helix sagittæfolia.
H. Helix var. *taurica* Rehd.: H. Helix sagittæfolia.
H. Helix var. *tessellata* Hort. 1893: H. Helix aureo-variegata.
H. Helix tortuosa Hibb. 1872: H. Helix Glymii.
H. Helix tricolor Hibb. *in syn.* 1872: H. Helix tricolor.
H. Helix Linn. var. **tricolor** Rehd. 1915: page 146.
H. Helix triloba Hibb. 1872: H. Helix triloba.
H. Helix Linn. var. **triloba** (Hibb.) Lawr.: page 156.
H. Helix variegata Nichols.: H. Helix Cavendishii.
H. Helix var. *venosa* Hort.: H. Helix hibernica.
H. Helix α *vulgaris* DC. 1830: H. Helix typica.
H. Helix Linn. var. **walthamensis** Paul 1867: page 141.
H. Hibernica Carr. 1890 and of Bean 1914: H. Helix hibernica.
H. Hibernica aureo-marginata Carr. 1890: H. Helix aureo-variegata.
H. hibernica Bean var. *maculata* Bean 1915: H. Helix maculata.
H. Hibernica marginata Carr. 1890: H. Helix aureo-variegata.
H. hibernica var. *Scotica* Seem. 1868: H. Helix hibernica.
H. himalaica Tobler 1912: H. nepalensis.
H. himalaica var. *sinensis* Tobler 1912: H. nepalensis sinensis.
H. japonica Paul 1867: H. rhombea.
H. japonica Tobler 1912: H. rhombea.
H. japonica Paul var. *variegata* Paul 1867: H. rhombea variegata.
H. japonica Tobler f. *variegata* Nakai 1924: H. rhombea variegata.
H. latifolia maculata Hibb. 1872: H. Helix maculata.
H. latimaculata Bean 1914: H. Helix maculata.
H. maderensis Koch 1869: H. canariensis typica.
H. nepalensis K. Koch 1853: page 121.
H. nepalensis var. **sinensis** (Tobler) Rehd.: page 122.
H. palmata Carr. 1890: H. Helix digitata.
H. poetarium Bertol. 1825: H. Helix poetica.
H. poetarum var. *taurica* Tobler 1912: H. Helix sagittæfolia.
H. Regneriana Hibb. 1864: H. colchica.
H. Regneriana arborea Hibb. 1864: H. colchica.
H. rhombea Sieb. & Zucc. *nomen nudum:* H. rhombea.
H. rhombea (Miq.) Bean 1914: page 129.
H. rhombea var. **variegata** (Paul) Schulze: page 131.
H. rhombifolia Rupr. ex Boiss. 1872: H. colchica.
H. sagittæfolia Hibb. 1864: H. Helix sagittæfolia.
H. scotica Cheval. 1933: H. Helix hibernica.
H. sevillana Spreng. 1903: H. canariensis typica.
H. sinensis (Tobler) Handel-Maz.: H. nepalensis sinensis.
H. Taurica Hibb. 1864: H. Helix sagittæfolia.
H. Taurica Leeana Hibb. 1864: H. Helix sagittæfolia.
H. Tobleri Nakai 1927: H. rhombea.
H. tricolor Nichols. *in syn.* 1885: H. Helix tricolor.

Names of unknown identity:

H. Helix cuspidata minor Hibb., The Ivy, 74 (1872).
H. Helix nebulosa Hibb. op. cit., 81.

H. Helix nigra Hibb. op. cit., 70.
H. Helix pellucida Hibb. op. cit., 81.
H. Helix pustulata Hibb. op. cit., 63.
H. Helix rugosa Hibb. op. cit., 69.
H. Helix succinata Hibb. op. cit., 86.